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FINANCIAL MANAGEMENT OF PORTS

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UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

Financial Management of Ports

Report by the UNCTAD secretariat *

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FINANCIAL MANAGEMENT OF PORTS

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Introduction

The Committee on Shipping at its seventh session took note of the increases which were taking place in port costs and requested the secretariat to undertake a study of this subject. This study, entitled "Causes of Increases in Port Costs and their Impact" (TD/B/C.4/167), was presented to the Committee on Shipping at its eighth session.

At the same time, and in order to provide port management with a better understanding of the accounting and financial functions in ports, the present report was prepared. Much of the material in this report has been used in recent port management training courses organized by the UNCTAD secretariat. The present report has been written in non-technical language to make the understanding of the basic concepts of accounting easy for those not specifically trained in this field and as a contribution to port management and port efficiency.

The presentation of the subject has been made so as to provide the reader with the possibility of treating each chapter independently. Those with no accounting background will find Part One useful as it deals with general accounting matters. Those interested in the topics covered in Part Two can follow them without having read the previous part.

Within Part One, chapter I explains the accounting functions and its contribution to management, and describes the principal technical terms used. Chapter II describes the principles or conventions on which the accounting is based and that are essential for an understanding of the financial information produced by the accounting system. Chapter III covers the products of the accounting system - i.e. financial reports and statements, their uses, characteristics and requirements as well as the more common formats of presentation. Chapter IV presents the organization of the accounting system and its elements, and provides a description of them.

Chapter I of Part Two gives the techniques for obtaining a better understanding of financial statements. Chapter II describes the costs and how to measure and control them as a means of assisting the planning in port operations. Chapter III explains the tools for financial planning, covering the short-term profit planning and the principal aspects of the budgeting function. Chapter IV is a series of comments on improving the financial situation, pointing out areas and procedures that can help the financial performance of the port.

Part III contains two case studies, and the annexes include a succinct bibliography for further reading and a glossary of accounting terms.

PART ONE

Basic accounting for non-accountants

Chapter I

INTRODUCTION TO ACCOUNTING AND FINANCIAL MANAGEMENT

How do you account for that?

1. This question has been asked time and time again during the past and is still being asked at present by managers.

2. Well, how does the accountant "account" for all the business activities which arise from the operations of a large organization?

3. With the knowledge of the generally accepted rules and concepts which the accountant applies to present, in monetary terms, what the port has achieved, what it owns and what it owes, the commercial, engineering and operations managers will understand and utilize better the work of their colleague the port accountant.

4. It has been said that business enterprises run on paper tracks, and most managers and senior officers in the port transport industry would agree. Moreover, they might add that in this respect, the finance and accounting department is the biggest paper producer of all, issuing regular daily, weekly, monthly and yearly reports and statements, bills and accounts. Whether all this paper output and the information contained therein is helpful to the manager in his duties is another matter.

5. Managers are successful if they perceive the task to be done, seek out the relevant facts and resources and use these to take prompt, effective action, most likely to assist the port in achieving its objectives, e.g. the discharge of a vessel in a time and at a cost satisfactory to all parties concerned. The information received from the accounting system should aid him in effectively fulfilling his duties.

6. Successful ports, like other prospering organizations, tend to grow bigger as time passes. Physical facilities of the port are improved or increased and this is often parallelled by a greater geographical spread of the new facilities. There invariably follows an increase in service and administrative staff as well as offices to house them.

7. As ports grow, the distance between different functions and managers increases. The span of management, i.e. the distance between managers and their subordinates, widens. These gaps have to be bridged if the port

is to remain successful. There is a premium on good communication, whether by the spoken or the written word.

8. It can be difficult to achieve full communication and understanding between managers and departments when the method of communication is by the spoken word. It can be more difficult to achieve full communication and understanding when the subject matter is communicated by the written word. It can be very difficult if the written information comes from the accounting department and consists of columns of figures poorly presented. In this case communication between the accounting department and the recipient of its labours is seriously impaired. There is therefore a special responsibility placed on the finance and accounting function to produce and disseminate prompt, concise, relevant information, presented in an easily assimilated way to all other managers and departments in the port.

9. Managers should be aware of the contribution the accounting function can make toward the satisfactory working of a port, particularly in the field of inter-departmental communication. Only by understanding how the accounting system of his port operates and the way in which the figures set out in its statements and reports are computed, can a manager obtain the maximum benefit from this information system. Such understanding will enable him to decide whether the data he receives are relevant to his needs and enable him to ask pertinent questions or call for different information to assist him in his job.

10. The many ports of the world have different organizations, aims and objectives. Their accounting and financial records may differ from one another in detail and presentation from the system outlined in the following pages. In general, however, the systems operated by all port organizations follow the same well-tried "rules and regulations".

11. Therefore, knowing these basic concepts of the accounting and finance function, the managers will improve their performance in their decision-making tasks.

Some definitions

12. Ports are enterprises. They can be owned and operated by a Government, a Local Authority or a group of private citizens. Whatever the circumstances, they do what other enterprises do, - i.e. they use resources in order to carry out tasks. The resources include land, buildings, equipment, people, materials of all kinds and the services of other organizations such as the telecommunications and public utilities.

13. Like other enterprises, ports generally acquire their physical resources by buying them complete - as with a fork-lift truck, or by constructing them over a period of time - as with new berths. These resources, or assets as they are called in accounting terms, are paid for in cash. Note that the term cash includes bank cheques as well as notes and coins. Some ports, when brought into existence might inherit facilities at no present cost to themselves, for example, an old naval base with its quays and buildings. If this is so, the previous owners paid cash for these resources when they were constructed at an earlier date.

14. One important point to remember is that these assets are part of the nation's wealth and it is the task of the managers in the port transport industry to use the resources in their charge as effectively as possible. These assets fall into two main categories. Those assets acquired to give service over a long period of time are called capital assets, long-term or fixed assets. Under this heading fall the infrastructure and super-structure of the port together with cranes, fork-lift trucks, tractors, equipment of all kinds, furniture and fittings, etc. Note that the term fixed assets does not imply immobility. Clearly, a fork-lift truck is not immobile but is classified as a fixed asset because it is purchased to give service for many years and is not quickly worn out or consumed. The second group or category of assets comprises those which are acquired and then used up in a short period of time, and are called current assets. This category includes materials, services, monies owed by port users (called debtors), cash and any other short-term resources, e.g. insurance cover, vehicle licences, etc. Clearly, the difference between the two categories of assets can be seen by considering the acquisition of a truck and the fuel stock it requires to operate. The truck will last for many years but the fuel stock for just a few weeks. Therefore, the truck is called a fixed asset in the records of the port, whilst the fuel and all other resources which are rapidly used up and replaced are called current assets.

15. We now need to know how the port, or rather those who manage it, found the money to acquire its resources. The owners, as noted earlier, could be a public or a private body. Whatever the position, their funds provide the first injection of money into the business. This first inflow of cash into the total funds of the port is recorded as "paid in" capital. If the port has operated profitably in past years and these profits have been retained in

the enterprise, then these retained earnings show as an addition to the owners' capital in the financial records of the business. These retained earnings are sometimes classified as reserves.

16. When it is necessary, additional cash or funds for the acquisition of assets can be raised by borrowing. Most enterprises can obtain loans if they are solvent and can pay the annual interest charged by the lender. Ports are no exception and loans figure prominently in most ports' sources of funds. Unlike owners' "paid in" capital, loan capital has to be repaid at some future time. There are many enterprises willing to lend money, such as banks, large insurance companies and other financial institutions. These lenders are called long-term creditors.

17. A further source of funds available to the port originates from the deferred payment of bills due to suppliers of stores, services, equipment, etc. This also arises when the port owes taxes to the state or local authority. While these creditors are unpaid, management can use this money for their operations. Of course, there is a limit to the extent to which a business can live on its short-term creditors as these suppliers are called. Of course, these accounts should be settled within the stated credit period or a reputation for slowness in paying outstanding bills means that in times of shortages of supplies and services, the business with a bad reputation in settling its debts could be last on the delivery list. Also, some suppliers charge a penal rate of interest on outstanding debts.

18. Monies owed to short-term and long-term creditors are called the "liabilities" of the enterprise. The assets, long-term or short-term, are therefore acquired from funds provided by owners and creditors. Clearly, the totality of these and the sources from which they were acquired must be equal in monetary terms.

19. As we see in Chapter III, this characteristic is the base of the balance sheet.

20. We have mentioned that the port acquires its resources from the owners, from loans and deferred payments of bills and from operations or services provided by it.[1/] These services in financial terms produce two elements: revenue and costs or expenses. The revenue consists of the payments that port customers make for the services provided and generally are regulated

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1/ For a more comprehensive approach to cost and revenue in port services, see the report by the UNCTAD secretariat Port Pricing (TD/B/C.4/110/Rev.1) United Nations publication, Sales No. E.75.II.D.7.

by published port tariffs. On the other hand, services rendered require the use of assets. This use, quantified in monetary terms, is called in accounting cost or expense and according to their nature and origin have several names, i.e. labour costs, administrative expenses, maintenance costs, dredging expenses, depreciation costs etc.

21. In simple terms the difference between revenues and costs and expenses gives the financial results of the port, that is profit when revenues are bigger than costs and loss in the opposite case.

22. A detail of the different elements that produce a given result is shown in the Revenue Statement which is explained in Chapter III.

23. Another way to obtain resources in ports is through so-called subsidies. This aspect is rather complicated as different approaches can be used. In the following paragraphs a brief discussion of them is given in order to show some of the implications for port management in dealing with this subject.

24. The long-term aims and objectives of a port may differ according to ownership. The objectives of a state-owned port could differ from those of a port owned by a regional or local authority. All ports would expect to earn revenue from the services provided to customers and should endeavour to insure that income exceeds expenditure. According to the economic policy of the country in which it is situated, a port may be the recipient of regular sums of money called subsidies. These are paid to the port out of state or regional funds and are calculated to ensure the financial viability of the port. For example, to reinforce state policy, certain goods might be encouraged to pass through the port by quoting charges that are below the actual cost. The subsidy would then be calculated to compensate for any income lost to the port.

25. Where, however, the subsidy is open-ended and given annually to cover actual cash deficits arising from the varied operations and activities of the port, this could lead to poor management, an indifference to costs and lack of financial control. If employees feel confident that any losses sustained by the port during the year will be covered by government funds, there is no real incentive to watch costs closely and make the best use of resources available.

26. By ensuring a positive cash flow, port management strengthens its position with the owners and is relieved of the onerous task of seeking borrowed money. Indeed many state and local authority-owned ports are now exhorted to act "commercially" and to be self-financing. Their aim should be

to generate a cash surplus of revenue over costs each year and to finance their long-term plans out of this surplus. If this desirable state of affairs is not immediately achievable, then the port managers could borrow money commercially, confident that they would be able to meet the annual interest charges and repay the principal over a number of years.

27. Some governments and local authorities give grants to ports to stimulate investment in capital facilities. These are once-and-for-all payments, such as a contribution to the cost of new quays or other major port developments. Obviously, these grants are welcomed by the managers but might lead to uneconomic development and undermine the concept of commercial viability. For prestige purposes a port might be encouraged to develop new capital assets which clearly cannot operate profitably.

Chapter II

ACCOUNTING CONVENTIONS

28. In the previous chapter we have described in broad terms how the accountant names the rights and obligations of a port as well as the results of the operations. Now we will describe the system used to record these transactions and the generally accepted conventions adopted as framework of this information system.

29. In defining accounting we find a wide variety of concepts which makes it more difficult to understand this term. A definition that can be considered as complete is the following:
"Accounting is the body of knowledge and functions concerned with systematic originating, authenticating, recording, classifying, processing, summarizing, analysing, interpreting and supplying a dependable and significant information covering transactions and events which are, in part at least, of a financial character, required for the management and operation of an entity and for the reports that have to be submitted thereon to meet fiduciary and other responsibilities." 1/

Double entry

30. Fortunately for management there has developed over the past four centuries a method of recording in monetary terms business transactions and activities. This method is internationally known as "double entry" accounting. It can be adapted to simple hand-written records or programmed for accounting machines and computers. It is extremely flexible and can record the most complex commercial dealings.

31. Earlier we noted the two sided nature of business. It can now be stated that all such activities involve the two-way movement of funds, and it is from this fact that double entry accounting has evolved. The two entries reflecting this movement are called debit and credit.

32. The basis of the double entry method is the premise that the amounts showed in debit must always equal the amounts showed in credit.

1/ Grady, Paul, Inventory of Generally Accepted Accounting Principles for Business Enterprises, American Institute of Certified Public Accountants, New York, 1965.

33. The term "account" means a statement showing debit and credit entries in respect of assets or liabilities. Every asset would have an account reflecting movements that have taken place in respect of that asset. Similarly, every liability would reflect the movement of any source of funds. There would be, in the accounting system, an account for <u>all</u> the different assets and liabilities of the port.

34. Then, in order to record one transaction in accounting an entry needs to be produced and the debit and credit must balance, i.e. they must be equal in amount. Depending on the nature of the transactions, different accounts should be affected.

35. In order to clarify these concepts let us examine the following example: A fork-lift truck is bought for $10,000.00 and the supplier is paid in cash. In this operation two accounts are going to be affected:

a) Cash account - credit of $10,000.00
b) Equipment account - debit of $10,000.00

36. To understand the double entry method it is necessary to know the following conventions:

a debit entry registers:
a) an increase in an asset account, or
b) a decrease in a liability account, or
c) a decrease in a capital account,

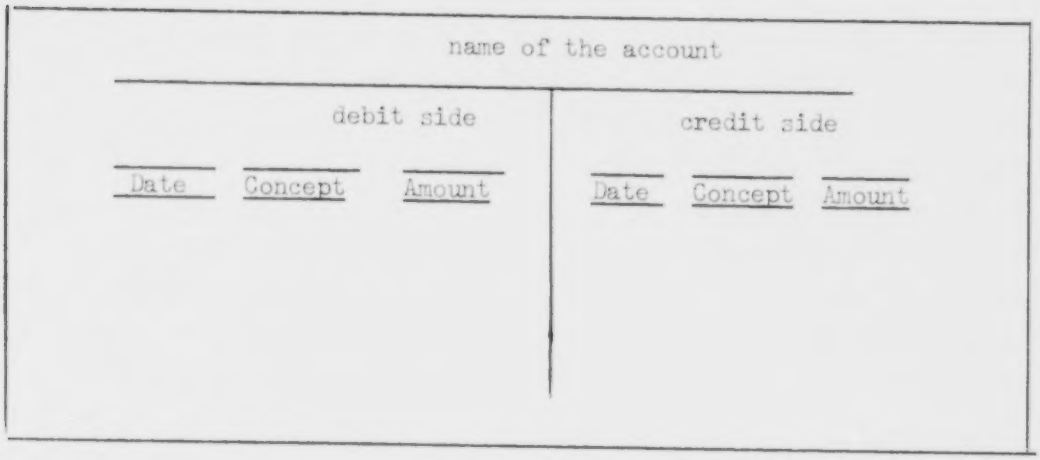
and is generally entered in the left side of the account

a credit entry registers:
a) a decrease in an asset account, or
b) an increase in a liability account, or
c) an increase in a capital account,

and is generally entered in the right side of the account.

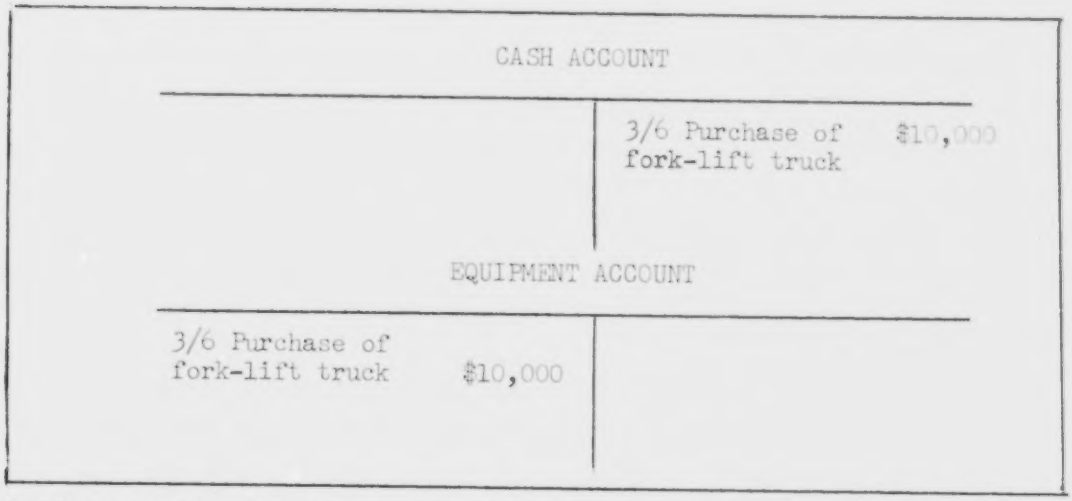
37. There are several ways to record the transactions, varying from handwritten books to computers. For illustration we will use here the most basic way: handwritten and two-sided accounts represented in figure 1.

Figure 1: Diagram of an account



Applying these concepts, we will record the operation of the previous example: (see figure 2).

Figure 2: Data recording in an account



Looking at the accounts presented in figure 2, now we know that our assets in cash have decreased by $10,000 and our assets in equipment have increased by the same amount.

38. In practice, the above accounting entries would involve the employment of other media such as invoices, credit notes, day books, journals, returns journal and other primary records. These are used to record the many transactions taking place in the business. The example shown above is illustrative only so as to emphasize the concept of double entry.

39. The entries that have to be made in the financial records of a port to note the acquisition of assets and the sources of funds from which they were acquired is only one part of the work of the accounting department. The employment of those assets requires many more accounting entries. Consider the activities of a busy port. All around can be seen the physical assets already referred to, including quays, cranes sheds, offices, storage and stacking areas. Cargo is loaded or discharged from vessels and transported by vehicles to and from ships, lighters, storage areas and port users' transport, by cargo handling staff. All the time these activities are taking place, and in many ports that could mean twenty-four hours a day, funds are flowing in and out of the cash resources of the organization.

40. These basic and regular activities described above are seen and are therefore easy to comprehend and the resulting effect upon cash resources not difficult to visualise. There are, however, many transactions taking place which are unseen, although they too give rise to an inward and outward flow of cash. These transactions, such as pensions for retired staff, interest paid on borrowed funds, loans, and dividends, all have to be paid by the port. Managers should understand that the picture projected for them to visualise is the constant port activity, the call on resources and the resulting inward and outward flow of funds through the cash resources of the organization. Clearly, these continuous and complex operations require an accounting system. Without this, it would be impossible to know whether the port was living within its income, or better still, generating a regular and satisfactory surplus for reinvestment in the port. Similarly, it would be impossible to ascertain how much money was owed to creditors and how much due from customers.

Monetary expression in accounts

41. The operations performed in a port can be measured in different types of units (cargo handling in tons per day, metric tons per gang hour or other units; storage in ton-days, metre-days or other units). However, for accounting purposes the diversity of units would make recording and summarizing cumbersome, if not impossible. Therefore, as a matter of convenience and usefulness, transactions are reflected in the accounts in terms of the monetary unit of the country where the entity is located and in which most of the operations take place.

42. An important fact implied in this convention is that only those aspects of the port that can be quantified in terms of money will be considered in the

accounts. Accounting will not tell the value of having capable persons in the administration, nor the reputation of the port among its customers. This limitation, nevertheless, reinforces the need to consider all the management information systems as complementary and interdependent if successful decision-making is to be achieved.

43. This convention is as well related with the historical costs that are used in the account records. In times when purchasing value of money does not change very often, past costs are reliable. Nowadays, inflation has posed problems and limitations to the financial information produced by accounting. A great deal of research has been done on the subject and some of the solutions proposed, applied to port examples, are given in the following paragraphs.

44. Since inflation has become a problem in many countries, accountants and economists have expressed the view that the Annual Reports of businesses should reflect the current value of their assets and liabilities and the Revenue Account entries adjusted to reflect the impact of inflation on net earnings, this information to be an addition to their "book values" shown in the conventional Balance Sheet and Revenue Account drawn from the historical accounting records.

45. Several methods have been proposed by means of which "book" values can be converted into "current" values, thus reflecting on businesses the impact of inflation. Two methods widely commended are:-

(1) Annual revaluation of all assets and liabilities. But this is a time and money consuming operation.

(2) Indexation - in which a base year is selected from a schedule of indices reflecting changes in the purchasing power of money. Difficulties arise in selecting the most appropriate index, e.g. retail price index, wholesale price index, heavy engineering price index, etc.

Example of indexation:
In table 1 we show the different values obtained by historical account and inflation account.

Table 1

Comparison between historical and inflation accounting

Historical accounting:	
Shed built in 1968	
Cost	$100,000
Estimated useful life: 10 years	
Present registered value	$100,000
Less depreciation to date (1973)	60,000
Book value (31 December 1973)	$ 40,000
Inflation accounting	
Current value 1968	
(100,000 x 1.50)	$150,000
Less depreciation over 6 years	90,000
Current value (31 December 1973)	$ 60,000

Table 2

Index of prices of consumer goods and services

Year	Index
1967	62.3
1968	65.2
1969	68.7
----	----
----	----
1973 (Dec)	98.1
1974 (Jan)	100.0

46. In this example the factor has been obtained (see table 2) dividing

the present index figure (1973) by the index of the year of construction (1968), resulting in a figure which converts money of 1968 into money of 1973, that is:

$$\frac{\text{(1973 index) } 98.1}{\text{(1968 index) } 65.2} = 1.50 \text{ (inflation factor)}$$

Proceeding in the same way we can obtain the 1973 factors for assets of different ages: 1967 - 1.57, 1969 - 1.43, 1973 - 1.00, 1974 - 0.98.

47. Comparing the figures given by historical and inflation accounting we notice that there is a gain in the value of the shed of $50,000 and an extra depreciation charge of $30,000, which will be shown in the financial reports as inflation adjustment.

48. In practice the problems arising from the translation of assets and liabilities from historical to current values are complicated and vary from country to country according to the rate of inflation. Since in ports the fact that most of the major assets have been acquired over many years complicates the issue, specialized accountants should be consulted to advise on these issues.

49. It should be noted that present proposals for accounting in times of inflation vary with the regulations of different countries.

50. In the United Kingdom, for example, recommendations are:

(1) To continue recording all business transactions in accordance with the practices of Historical Accounting.

(2) To prepare conventional Annual Reports from these records as in past years.

(3) To prepare <u>Inflation Adjusted Annual Reports</u> using suitable indexes to calculate the current value of the assets and liabilities of the business and the Profit or Loss for the period under review. When the use of index factors produce clearly erroneous values, then the current market values should be substituted for the index-adjusted figures.

51. As we said before, the problems of producing inflation-adjusted accounts can be left with the accountants. In the everyday running of the port, most of the decisions of the managers will result in the inward and outward flow of funds which are expressed in current values, e.g. wages, salaries, overtime, fuel, power costs, etc. and it is when costing for "Pricing" that the managers concerned must take inflation into account so that the tariffs of the port cover rising costs and allow for the declining purchasing power of money.

Time concept

52. In order to measure the performance of a port or other business, it is necessary to establish periods, otherwise we will not have the basis for proper and opportune decisions. Generally, the accounting period is twelve months. This need of periodical information and measurement produces a problem of recognition and allocation of revenues and expenses.

53. Suppose we take the twelve-month period which ends on 31 December. The port is busy, perhaps working three shifts for most days of the year. To record all this activity, the accounting system is daily processing thousands of entries and this task is continuous. These activities do not stop at 31 December for the benefit of the accountants or other managers. Nevertheless, the accountant must draw a line in his books at this date and endeavour to summarize all the income, costs and expenses relevant to the twelve months under review. This is not a simple task. It involves the concepts of prepayment and accrual.

54. At the end of the year all accounting entries must be scrutinised to ensure that they relate to the year in question. Perhaps an insurance policy, annual premium $120,000, is paid on 1 October. It covers a twelve-month period to the next 30 September. Clearly, only $30,000 is relevant to the current year and $90,000 belongs to the following year.

55. The $90,000 carried forward in the ports insurance account would be described as a "prepayment" or "payment in advance". It would be grouped with other short-term or current assets, in the end-of-the-year statement of assets and liabilities, known as the balance sheet.

56. On the other hand, goods and services may have been received by the port during the year, and at 31 December the invoices for these assets have not been received. Since these services, etc. were incurred during the year, an estimate of their cost must be brought into the accounting records. This entry is called an accrual. For example, an employee has had an accident and is suing the port for damages. Professional services have been rendered by a firm of lawyers and their invoices have not been received by 31 December. These costs have to be brought into the accounting records by means of an accrual. The amount to be accrued would depend upon the information available to the accountant but would be as accurate as possible. Many such adjustments are made when computing the final figure of profit for the year. The items accrued are grouped with other short-term liabilities in the end-of-year statement of assets and liabilities, i.e. the balance sheet.

57. The fixed or capital assets generally have a long life spanning many years. They are used to provide the port services and their cost should be distributed among the several accounting periods of their useful life. This technique is called depreciation. In accounting, more emphasis is made in the allocation of costs than in the evaluation of the assets. Due to the several meanings which are given to this word, many problems arise when talking with accountants. In many cases the word depreciation is used to name the process of decrease in value (this fact can have different causes, i.e. obsolescence, wear and tear, etc.). In other cases, depreciation is used in the sense of losing functional efficiency. In order to clarify the meaning of this word in the accounting practice, we give the following authoritative definition: "Depreciation accounting is a system of accounting which aims to distribute the cost or other basic value of tangible capital assets, less salvage (if any), over the estimated useful life of the unit (which may be a group of assets) in a systematic and rational manner. It is a process of allocation, not of valuation. Depreciation for the year is the portion of the total charge under such a system that is allocated to the year. Although the allocation may properly take into account occurrences during the year, it is not intended to be measurement of the effect of all such occurrences".1/

58. Depreciation in accounting can be calculated in several ways; i.e. using replacement or original cost, decreasing charges, increasing charges, production methods, sinking fund and annuity methods and the straight line method, which is the most common and extensively used.2/ Some of these methods are described in Annex I.

Valuation of stocks of current assets

59. In addition to calculating the annual cost of using capital or fixed assets there is also the question of measuring the consumption of current assets, i.e. those used up in a relatively short period of time. All stocks and stores must be valued at the end of the year in order to see how much has been used during the previous twelve months. If the port commences its accounting year with stocks of, say, paint, and during the year purchases further supplies, then the total of opening stock plus purchases less the amount of stock left at the end of the year indicates the quantity of paint used during the year.

1/ Paul Grady, op. cit, P. 420.

2/ According to an UNCTAD survey carried out during the preparation of the UNCTAD report Port Pricing (op. cit), 89 per cent of the sample indicated that they used this method in ports.

60. This sum would be charged in the year's revenue account or profit and loss account. Stocks are sometimes pilfered, and poorly supervised stocks can mean that the charge against income for stores used camouflages losses through theft.

61. The valuation of stocks and stores in hand raises the problem of how that valuation should be calculated. Suppose stores included paint in containers, identical in quantity and quality. It is possible for different deliveries to have been charged at different prices.

62. This is a difficult and time-consuming task. Ports often cover a large area of land. Many may have several places where stores are kept.

63. Stocktaking is complicated by the different ways in which stocks can be valued.

Example: Paint is purchased by a port as follows - all of the same quality.

January	5,000	litres - Price	$10	$50,000
June	8,000	" "	$12	$96,000
October	6,000	" "	$14	$84,000
November	3,000	" "	$15	$45,000

and there were 4,000 litres in stock at the beginning of the year valued at $40,000. Requisitions were made during the year and on 31 December 5,000 litres remained in stock. All paint was used for maintenance work.

64. Using 'First-in-first-out' method of stock pricing, the sum of $242,000 would be charged as a cost against income in the Revenue Account and stocks of paint in hand shown as $73,000.

65. Using the 'Last-in-first-out' method the charge would be $265,000 in the Revenue Account and the value of paint in hand at 31 December would be $50,000.

66. If the market price of paint had slumped to $8 a litre by the end of the year, the stock in hand would be valued at $40,000 and $275,000 charged against income. Stocks can be issued at a Standard cost or an Average cost. Different ways of valuing stock in hand at the end of the year would result in different costs appearing in the Revenue Account. All these methods are acceptable and used by different accountants. The same valuation process would be used for all stocks and stores remaining at the end of the year.

Consistency

67. In accounting there are several practices and methods in assessing and presenting financial information, especially in the case of valuation of

investments, valuation of inventories, depreciation methods, accounting periods, etc. This convention requires that (a) the best suited methods for the needs and purposes of the business are to be used and (b) this method should be used consistently through the life of the entity. Nevertheless, whenever a change is necessary, it should be done, but a notice about it and its effects must be given in the financial reports affected.

Going concern

68. All businesses are full of risks and uncertainties. Overlooking this fact can lead to a situation where decisions are made based on unrealistic assumptions. This convention establishes that over-optimistic assumptions should be avoided in accounting as they can cause misleading information. It advocates objectivity and realism in the preparation of accounts and reports.

69. All the conventions herein described are the most important ones for a better understanding of accounting. They have been generally accepted in most countries of the world. Nevertheless, some differences can arise with those applied in a specific country. Therefore, it is recommended to those who want a more detailed description of local accounting conventions and practices to approach their respective national accountants institutes as these bodies are the most authoritative voice in the subject.

Chapter III

FINANCIAL STATEMENT AND REPORTS

70. The previous pages have considered the need for an accounting system in port management and the basic concepts employed by accountants to operate it. All the information recorded in the accounts is periodically summarized and different reports are issued about revenues, costs, expenses, assets and liabilities.

71. Through the information provided, management is assisted in:

a) Evaluating the performance of the port in its use of resources

b) Assessing the financial stability of the port

c) Assessing its future performance, its capacity to generate profits and prospects for expansion

d) Assessing the return on the capital employed.

72. External information requirements are also fulfilled since there are several parties, such as investors, creditors, government and the general public, each of them having special needs and interests.

73. The financial reports, therefore, vary in content, length, detail and periodicity according to their purpose and whether they are produced for internal or external users.

74. The financial reports, in order to be useful and reliable, need to have the following qualities:

a) Objectivity: they must be based on information which is measurable and capable of independent verification.

b) Realism: they must disclose a realistic view of the operations and financial state of the port.

c) Comparability: the terms and methods used in producing them must allow comparisons with those of other similar entities and with reports from one year to another.

d) Intelligibility: they must provide, in the clearest and simplest form the information that a non-specialist can use.

e) Timeliness: they must be produced within a short time interval following the end of the period on which they are reporting, in order that decisions they assist in can be useful and opportune.

75. There are as many reports as there are financial aspects of a port. Some of them are analytical and show the detail of a situation like a statement showing creditors, debtors, inventories of stocks or fixed assets. Others are general, showing the whole state of the port. Some are required by law or statutory regulations. Among them we find the balance sheet and the revenue statement which are the classical financial statement, and the cash flow statement that has gained popularity in the last ten years owing to its usefulness.

76. Many ports, as well as many other enterprises, produce annual reports in which the financial reports are included, together with analytical information about different aspects of the entity. These documents are important since they allow the reader to know the general situation of the port and its trends of development, and allow comparison with other enterprises of the same field.

Balance sheet

77. This financial statement presents the situation of the port on the last day of the accounting period reported, showing in monetary terms its capital, reserves and liabilities and the manner in which these resources have been distributed over the different types of assets.

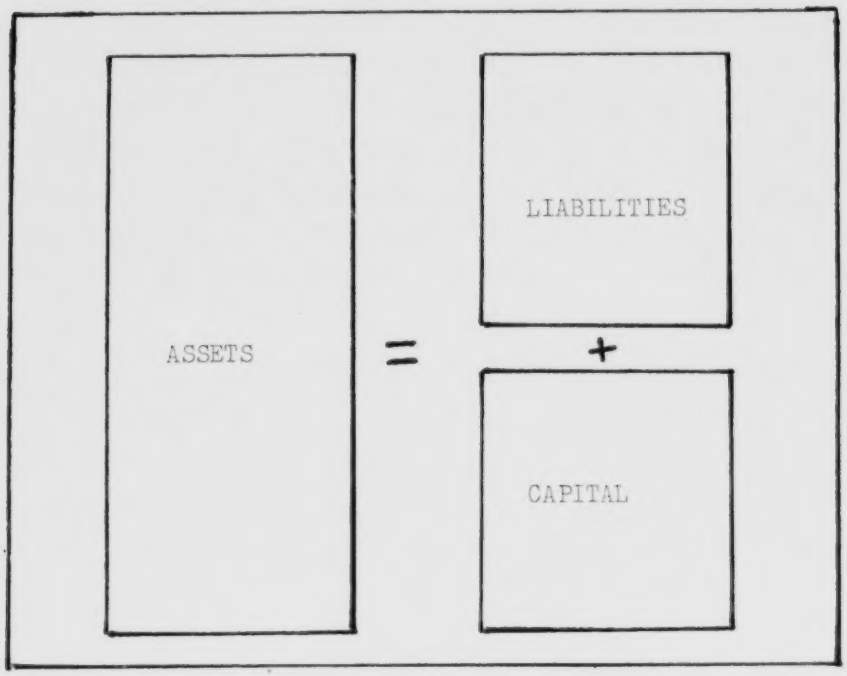
78. Also it is called a financial position statement and it can adopt several forms (see figures 3, 4, 5 and 6). Nevertheless, when it is presented separately the heading always contains the following elements:

a) Name of the port (or entity)
b) Mention of being a balance sheet
c) Date it is reporting.

79. In the traditional form the balance sheet shows the assets on the left hand side and liabilities and capital on the right hand side. (see figure 3).

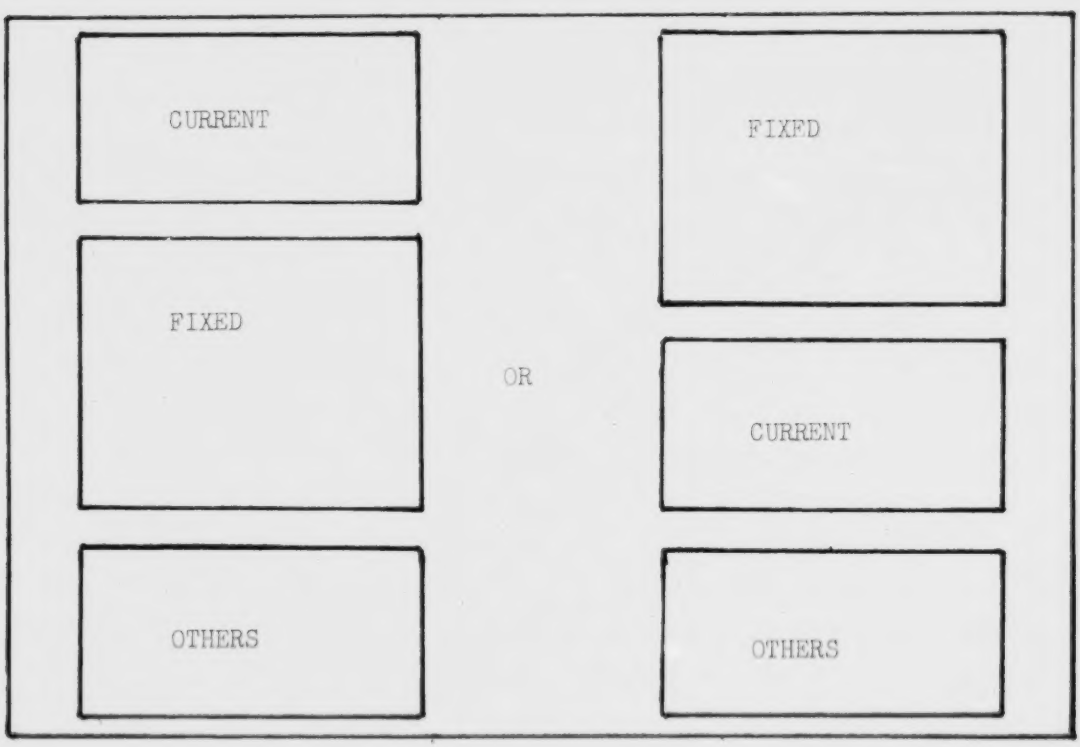
80. The assets are listed according to their liquidity, i.e. the ease with which they may be converted in to cash during the normal operation. For purposes of interpretation and analysis, the assets are classified as "current", "fixed" and "others". The first group contains cash and items that are continuously being converted into cash such as accounts receivable, stores, security investments, etc. The second group includes equipment, constructions and those goods with a long durability in the life of the port, and the third class (not always used) of "other" assets includes those which cannot be considered as either "current" or "fixed" assets.

Figure 3: Diagram of a balance sheet



81. In ports, the biggest investments are made in fixed assets and this is the reason why some balance sheets show in first place this group, with current and other assets in second place. (see figure 4).

Figure 4: Types of presentation of assets in the balance sheet

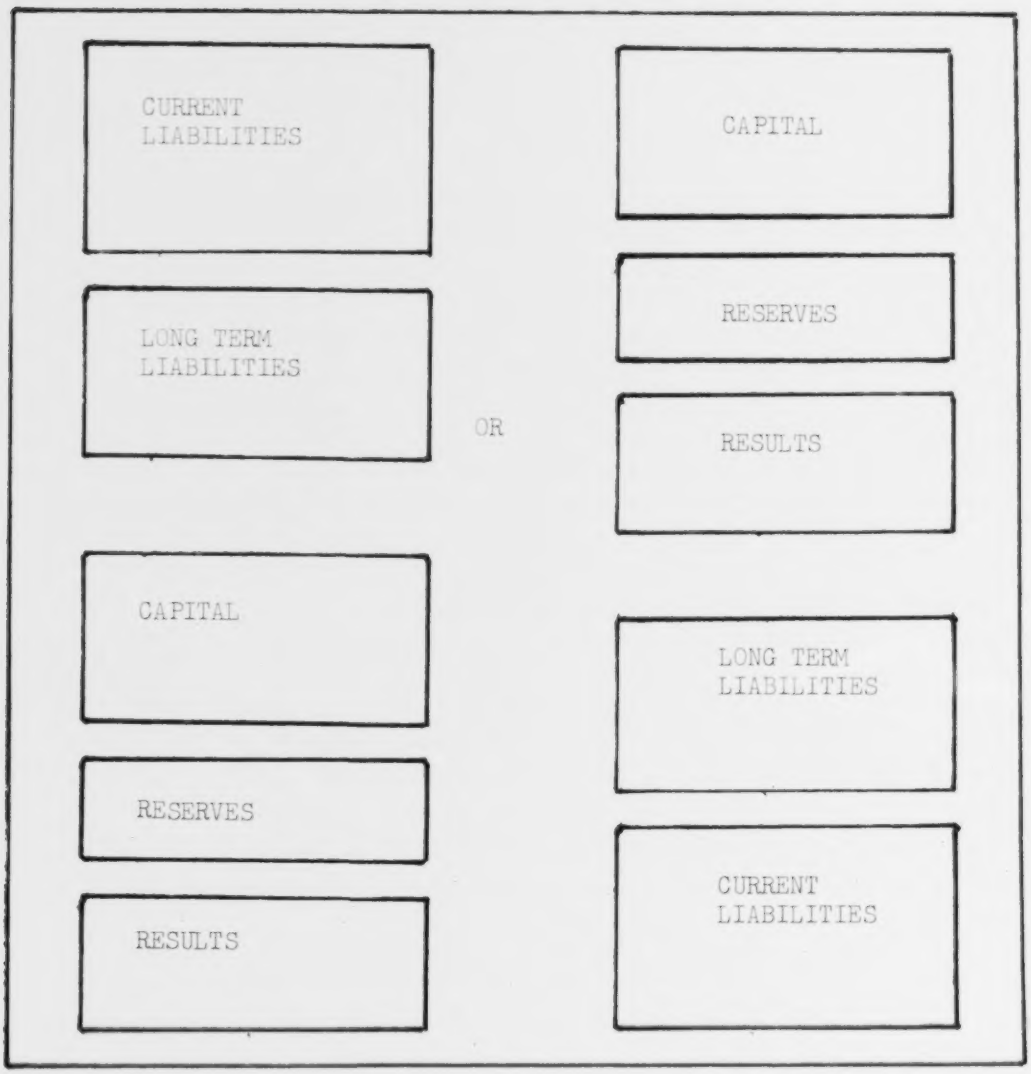


82. The liabilities are listed according to the date they are due to be paid. The current or short-term liabilities are generally due to be paid within one year and include items such as accounts payable, salaries and wages earned by employees but not yet paid, and other short-term obligations. The long-term liabilities have a maturity date that exceeds one year, i.e. long-term loans, debentures and bonds.

83. The next section is capital or owners' equity and presents the owners' investment, retained earnings (sometimes called reserves) and the results of the period.

84. In some cases the liabilities are shown first, followed by the capital items, whilst in other cases the order of presentation is reversed. (See fig. 5)

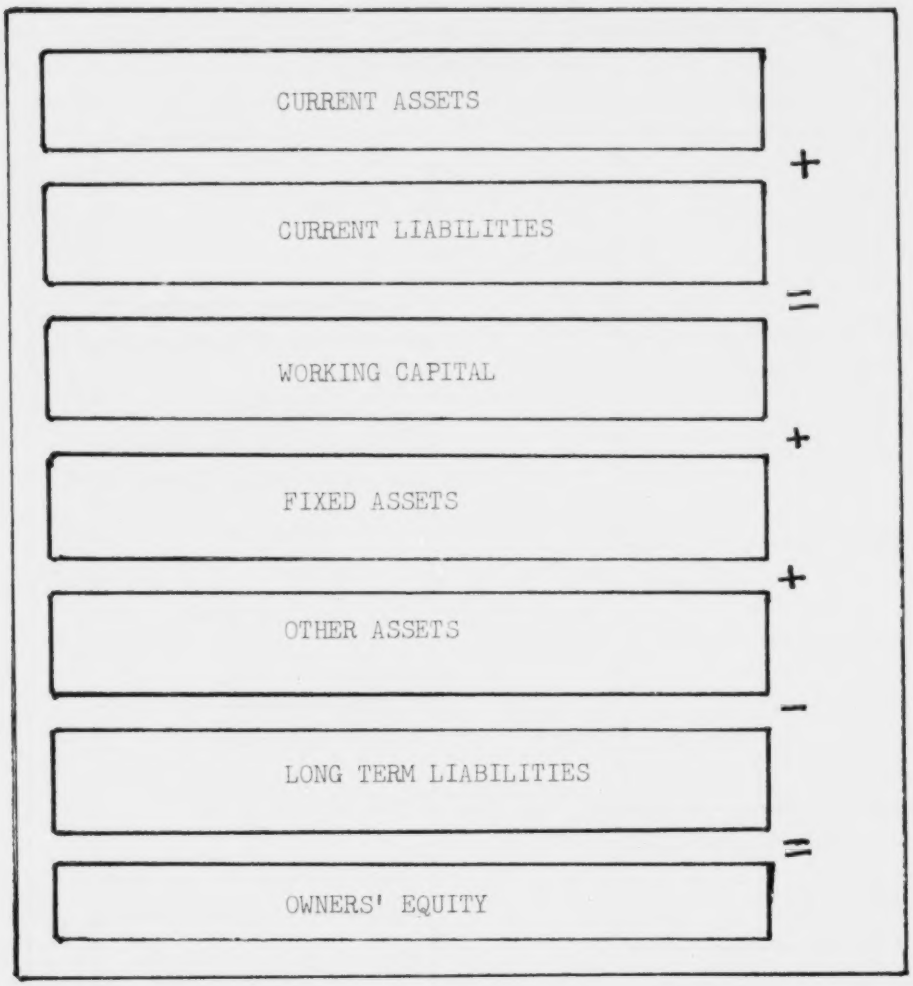
Figure 5: Types of presentation of liabilities in the balance sheet



85. This form of presentation stresses the equity that prevails in any business, i.e. assets equal to liabilities and capital, as it shows that all of what is owned (the assets) has come from external (liabilities) or internal (capital) sources.

86. Another way of presenting the balance sheet is the so-called "financial position form". (see figure 6). This distribution attempts to give some financial analysis by presenting a grouping of current assets less a grouping of current liabilities, in order to show the amount of "working capital". Working capital plus other assets, less long-term liabilities, is then equated with capital (or also called owners' equity).

Figure 6: Financial position form - presentation of balance sheet



87. Terminology may vary from country to country or from entity to entity. For example, "profit" may sometimes be described as "net income", appropriation

fund or account or surplus, and "accounts receivable" may be sometimes called "sundry debtors".

88. Differences in form and terminology are due to national accounting practices and national laws regulating the status of ports or entities.

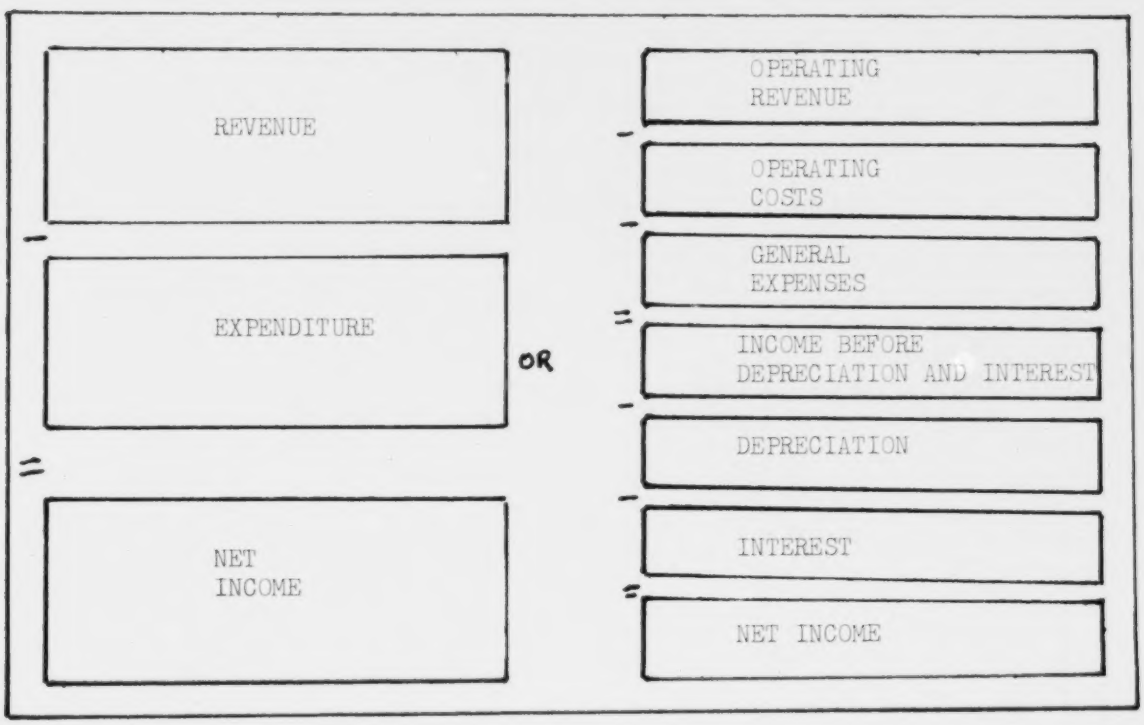
Revenue statement

89. This financial statement summarizes in monetary terms the operations and results of the port (or entity) during the period reported. It is also called the profit and loss statement, income statement or statement of profits.

90. This report shows the revenue obtained from the various types of operations and the expenditure incurred. The difference between the two elements is called the profit, net income or surplus.

91. This basic distribution varies, as in the case of the balance sheet. In some instances more detail is shown, setting different stages of income, and in other instances it is presented in broad grouping (see figure 7).

Figure 7: Diagram of Revenue Statement



Whatever the form presented, the heading has the following elements:

a) Name of the entity

b) Mention of revenue statement

c) Period reported

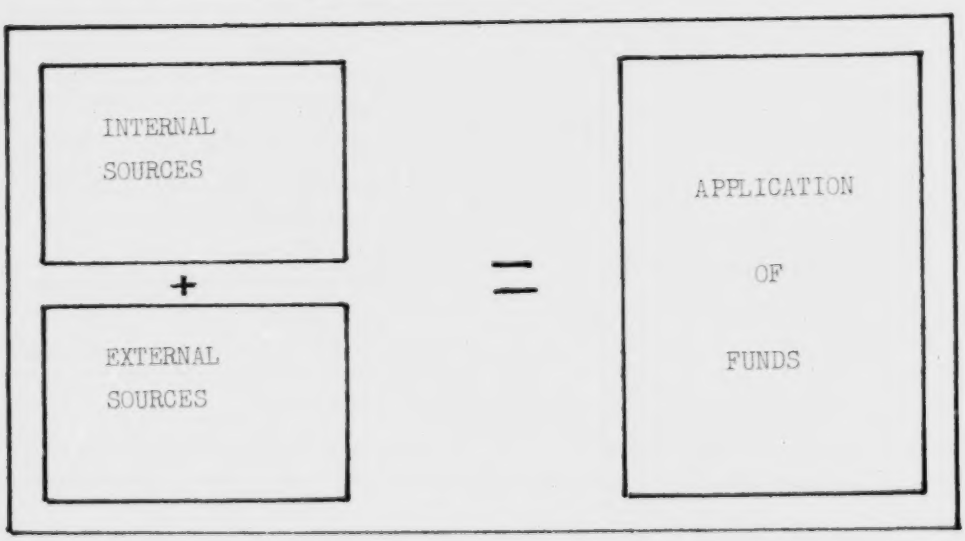
92. Special attention must be paid to the terminology in this statement since several terms are used for the same concept and sometimes in an interchangeable fashion. An example is the term "income", which is used to mean the financial inputs produced by the sale of goods or services in some cases, whilst in other cases "income" means the different between inputs and outputs. To avoid confusion it is recommended that the exact meaning of the words be obtained from those who prepare the report.

Cash flow statement

93. We have seen the basic statements produced by the accounting system. Another report that has become popular in the last ten years is the "cash flow statement" due to the useful information which it provides to the management.

94. It has adopted several names, such as fund statement, statement of source and application of funds, or statement of changes in financial position. It describes the sources from which additional cash was derived in a period and the uses to which this cash was put. A distinction is shown between the internal and external sources of cash (see figure 8).

Figure 8: Diagram of cash flow statement



95. This report is helpful to management because it:

a) presents information not included in the balance sheet or in the revenue statement

b) presents articulated information about the flow of funds.

96. Not all the expenses and costs showed in the revenue account are necessarily outflows of cash, nor all the revenues inflows of cash. On the other hand, the balance sheets show only balances, not movements. The cash flow statement thus complements these two reports.

97. This statement is prepared in several forms, depending on how the accounting system has been designed. A simple method consists in comparing the figures of two consecutive balance sheets, thus obtaining the differences and presenting them as a source or application of funds according to the following rules:

a decrease of assets means a source
an increase of liabilities means a source
depreciation or amortization reserves means a source
the net income or profit means a source
an increase of assets means an application
a decrease of liabilities means an application

98. This method, although not fully accurate, since it includes some transactions which are not flows of funds, is nevertheless useful when the accounting system has not been specially adjusted to produce this kind of statement.

Chapter IV

ACCOUNTING ORGANIZATION

99. In this chapter we describe briefly the mechanics of the accounting system, and the media used, as well as the functions performed in order to provide information to different parties (see figure 9).

100. As we have previously seen, the accounting system is intended for recording, classifying and summarizing all financial transactions affecting the situation of the port.

101. The first stage of recording is supported by the source documents. Based on these documents, duly authorized, the accounting entries are made. Among them we have (1) Payroll records, (2) Invoices for materials, stores and services rendered, (3) Vouchers showing stores received and issued and other expenditure not necessarily supported by invoices, e.g. travelling expenses, (4) Bills to port users based on tariffs for conservancy, cargo handling and ships' services, (5) Other documents supporting the repayment or receipt of loans. At regular intervals, entries must be made in the financial records which should be supported by properly authorized internal documents. To cope with depreciation, for example, a charge must be made periodically to debit the expenses accounts and credit the accumulated reserve. If a port user has failed to settle his debt and the amount has been regarded as irrecoverable, a duly authorized voucher should be issued to charge the provision for doubtful accounts receivable.

102. All the entries have to be recorded in the primary accounting records. These could include wages and salaries books, purchasers' day books, stores' books, dues and charges day books, petty cash books, cash books and journals. The names of these primary records might well vary from country to country. However, their purpose is the same, i.e. recording in chronological sequence the source documents using the double entry system so as to adapt the flow of information in the way required by accounting techniques. Periodically all this data is summarised and transcribed to the ledgers or secondary records.

103. The ledgers are the accounts where operations of similar nature are grouped, firstly by sections of the balance sheet and secondly in a detailed form using auxiliary cards that reflect the individual operations of any determined person or good. In this way we have a control account of debtors or creditors and collaterally auxiliary cards showing the operations (debits and credits) and balances of each person. The same distribution is followed with fixed assets, loans, prepaid expenses, general expenses, operating costs and operating incomes.

104. At regular intervals this information is concentrated and financial reports are produced, generally, according to legal regulations. A balance sheet and an income statement are produced annually in a financial report which covers the relevant accounting informations together with other useful data for owner and the public.

105. For management purposes other reports are produced quarterly or as often as required for the day-to-day operation of the port.

Accounting procedures manual

106. To ensure that the accounting system will work properly the port management must compile a manual where the procedures to follow, the documents to use, the records required, job descriptions, the name of the accounts and their operations are described. The value of such manuals is considerable, but the content must be scrutinized regularly to see that the procedures do not ossify and fail to reflect necessary changes in the port activities.

Auditing functions

107. Another important part of the system is the auditing function. It consists in verifying all the information processed in the accounting system in order to ensure that the reports produced are reliable. This task is carried out by two elements, i.e. the internal and external auditors. The internal auditors, who are permanent personnel of the port, verify that the procedures established in the manual are followed, that the source documents used are valid and that the accounting staff is working properly. The external auditors, who must be authorized chartered accountants, give an independent opinion regarding the financial statements issued for public purposes, whether these reflect the financial situation of the port, and if the accounting systems comply with the generally accepted principles of the profession.

108. The accounting system may vary from handwritten techniques to electronic equipment. Nevertheless, the basis herein described (see figure 9) is the same and the aim is always to provide useful and timely financial information for the port manager and help him in the task of decision-making. Some examples of accounting documents, records and reports are given in Table 3.

Figure 9: Basic scheme of an accounting system

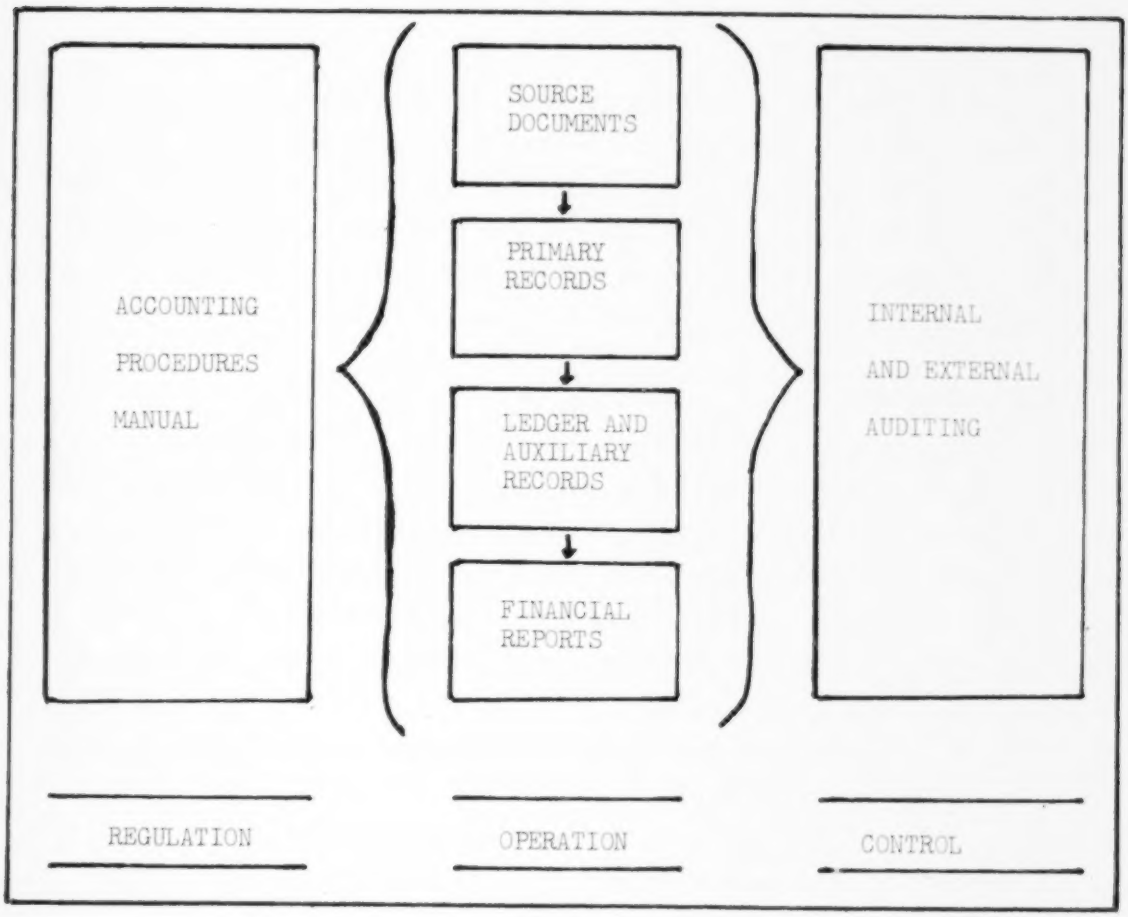


Table 3

Some examples of accounting documents, records and reports

Source documents	Payroll records Invoices (stores, services, capital assets) Vouchers (expenses, stores received and issued) Bills to port users Sundry vouchers (loans received and repaid, cheque books)
Primary records	Wage and salary books Cash books Day books Petty cash, storekeepers' return Dues and charges day book Transfer journal
Ledgers	General or nominal Fixed assets Debtors Creditors
Reports	Revenue account Capital employed Operating statement Revenue and cost analysis Cash flow Capital projects Outstanding debtors and creditors Future loan repayments and borrowings

PART TWO

Management information services

Chapter I

ANALYSIS OF FINANCIAL STATEMENTS

109. The purpose of financial information is to provide the basis for facilitating decision making. Forecasting and evaluating the performance of a port involves the study of many factors, including volumes and types of traffic, productivity, etc. Financial statement analysis is complementary to these tasks. In this chapter we examine (a) the techniques of this analysis (b) the usefulness of it.

110. The financial statements (the balance sheet and income statement) show the situation and operations of the port. Analysing them involves three types of comparisons:

(a) comparisons of items within a single period's statements
(b) comparisons over time
(c) comparisons among different entities.

These types of comparisons can be done using percentages, ratios, trends or deviations.

Single period comparisons

111. Some useful measures can be obtained from the financial statement by applying percentages to the different figures shown in the balance sheet and income statement. That is, considering 100 per cent the total assets, we can find what proportion is current or fixed. In the same way, if total liabilities plus capital is 100 per cent we can find how the sources are distributed, i.e. whether the port relies more on internal or external financing.

112. Applying the same technique to the income statement, the importance of certain sources of revenue or certain expenses is shown, alerting the reader to it.

113. If the data shown in the statements are placed in ratio form the same useful conclusions can be drawn. Nevertheless, it is important to mention that it is not recommended to study these ratios separately but to consider them as a whole, and, of course, ratios only have any meaning at all if there is some link or relationship between them.

114. Ratios can be obtained under the following headings:-

(a) profitability
(b) solvency
(c) activity
(d) structure.

(a) Profitability

115. There are several ratios that can show or help to measure the capacity to produce profits. Among them we find the return on investment, that can be obtained as follows:

$$\text{return on total assets} = \frac{\text{Net income}}{\text{Total assets}}$$

$$\text{return on capital} = \frac{\text{Net income}}{\text{Owner's equity}}$$

The names and elements involved in these ratios vary from country to country, and in cases of comparison it must be verified that the two ratios for comparison have the same bases and elements.

116. Another ratio that is useful to obtain, especially in ports generally requiring loans, is the ratio "Times interest earned".

$$\text{Times interest earned} = \frac{\text{Operating income (tax excluded, if any)}}{\text{Interest paid}}$$

which shows the capacity of servicing a debt through the normal operations revenue.

(b) Solvency

117. These ratios indicate the ability of the port to meet its short-term financial obligations. Usually they can adopt any of these forms:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{Acid test ratio} = \frac{\text{Quick assets}}{\text{Current liabilities}}$$

In the last case, the quick assets include cash, marketable securities and receivables but not inventories or other items that are not immediately realizable.

(c) Activity

118. These ratios show financial aspects of the operations of the port and its administration. Some of them applied in ports are:

$$\frac{\text{Annual average accounts receivable}}{\text{Average daily gross revenue}} \times 360$$

which gives the turnover of receivables in days. It is useful in assessing the efficiency of bill collection or the credit policies with

port users, and

$$\frac{\text{Net income}}{\text{Total revenue}}$$

which shows the percentage profit produced in the operations.

(d) Structure

119. These ratios show the financial composition of the port and among them we find:

$$\frac{\text{Long-term liabilities}}{\text{Long-term liabilities plus capital}}$$

which shows the proportion of external fixed resources related to internal fixed resources, and

$$\frac{\text{Total owners' equity}}{\text{Total liabilities plus owners' equity}}$$

which shows the proportion of internal resources to total resources.

120. It must be stressed that the ratios mentioned above have been obtained from financial statements in order to analyse them. Other ratios and indicators required for the daily management of the port can be produced directly from the accounts in combination with operational data[1/].

Comparisons over time

121. Obtaining ratios for a single year, although of some use, is incomplete and the interpretation can be misleading. Studying figures for several consecutive years will help in defining the trend the port is following. However, in this case it is important to identify the facts that are transitory and those that are permanent. This will improve the picture of the trend.

122. The initial and most simple step is to present financial statements of successive periods so as to allow an item-by-item comparison. By doing this, trends and changes can be observed and measures to improve the financial performance taken.

123. Comparisons can be made also with the different ratios obtained in several successive accounting periods, allowing a better judgement of the financial situation of the port.

124. Another use of collecting these figures over a number of years is forecasting. Utilizing financial information in conjunction with operational and other types of information will provide a better basis for the long-term planning of ports.

1/ See, for example, the report by the UNCTAD secretariat, Port performance Indicators (TD/B/C.4/131/Supp.1/Rev.1), United Nations publication, Sales No. E.76.II.D.7

Comparisons among different entities

125. It is useful to know how the port has been developing over the years. Nevertheless, it is also important to compare its achievements with those of other, similar undertakings. Managers could draw many conclusions from this type of comparison. This aspect has not been given the attention that it deserves, due, perhaps, to the difficulties involved. It would be unrealistic to expect a worldwide comparison of financial information on ports. Nevertheless, it would be useful if ports of the same country (or region, if possible), could establish a body to look after this function.

Usefulness of financial statement analysis

126. Financial statement analysis is the activator element for further investigation of causes and effects. When this task is done and not followed by other actions a great deal of effort and resources is wasted. Using the proper ratios and forecasting techniques, the port management can predict, with a reasonable margin, the solvency and profitability of the undertaking and apply these changes of policies and practices in such areas as pricing which will improve the port's financial situation.

Chapter II

STUDY OF COSTS

127. As we have indicated, accounting information assists the port manager in judging whether the financial objectives are met. One of these could be a satisfactory net surplus of income over operating and administrative costs. Perhaps the current annual accounts indicate that this is not so. The port's activities during the year in question failed to yield the expected surplus. What action can management take to alter the situation so that the unsatisfactory return can be turned into an acceptable one?

128. Using a very simplistic and hypothetical case we are going to stress the importance of costs. One approach would be to calculate the additional income needed and raise the tariffs of the port by whatever percentage is considered necessary to achieve the required surplus. If costs remain unchanged and throughput does not fall, then this problem should be solved and a satisfactory surplus achieved.

Example	$ million
Income - all sources	60
Costs and expenses, including interest and depreciation	50
Net surplus or profit	10

Required surplus $16 million

129. In order to generate $16 million the income would have to be increased by 10 per cent and if costs remained the same, the required financial objective would then be met. But this increase on all sources of income could lead to customer resistance and therefore a fall in traffic. Especially where a number of ports are geographically close together and in competition, a 10 per cent increase in tariffs could result in trade moving away to a neighbouring port. Clearly, a port would need to study carefully the net yield from its traffic, ships' dues, handling or storing cargo etc., before increasing charges by a blanket percentage.

130. Where ships and cargo have travelled a long distance between the ports of loading and discharge, port dues and cargo handling charges may be a relatively small part of the total freight cost incurred in transporting the cargo. Where sea voyages between ports are short, however, port charges and dues make up a much larger proportion of the total freight charge. An increase in port dues etc. of 10 per cent

on short sea voyages and coastal traffic could have a major impact on the total freight charge. On longer voyages the impact would be less, leading to a smaller percentage increase in the total tariff. So increases on tariffs should be strictly selective, since short voyage traffic might easily be driven away.

131. Another approach to generating the additional $16 million required to meet management's financial objective could be to reduce charges and so hope to capture extra traffic from neighbouring ports. Other factors being equal, the port with lower tariffs might expect to attract more trade. There is a real danger in this step, however, which has deceived many managements. Some commodities might be handled more cheaply than others so that a reduction in charges could be made to port users. In other words, the difference between income and costs is such that tariffs could be reduced and yet some of the commodities handled generate an acceptable profit. For other commodities the cost of handling might be so high that if a reduction were made in the charges, then the port would make a loss upon each tonne handled.

132. We have mentioned just a few elements that have an impact on revenues. In deciding what to do, many facts that can only be appraised subjectively need to be taken into account. Furthermore, of all the elements affecting the revenue, the tariffs and costs are the only aspect that can be controlled internally by the port management.

133. Perhaps the costs of operating the port could be reduced. A reduction of 12 per cent would reduce costs by $16 million and thereby increase the profit to $16 million, the target figure. Admirable though this approach may be, where should cost reduction start? Without figures to identify the costs, managers cannot know what changes would help or hinder their plans. An indiscriminate cost-cutting assault could do more harm than good.

134. To a certain extent, costs can be controlled by port management, but information about the nature and behaviour of them is necessary to avoid erroneous decisions.

135. Terminology in this subject of costs is sometimes rather confusing and much time and confusion can be saved if the precise meaning of cost terms are well-defined.

136. Generally speaking, cost is the total of efforts and resources used to produce a good or a service. In financial terms the cost is the amount of money that must be paid for a good or a service.

137. The proper definition of cost depends on the purpose for which the information is used. In the following section we give some examples in order to clarify the ideas and avoid misunderstandings.

138. According to their behaviour in relation to fluctuations in the activity evaluated, the costs can be fixed or variable. Fixed costs are those that within certain limits of time and volume (or intensity in the activity) remain constant. Variable costs are those that change in proportion to changes in activity.

139. According to the traceability of the costs in relation to an object or activity they can be direct or indirect. They will be considered direct costs if they are obviously related to an object and indirect costs in the opposite case. Some costs can be direct or indirect depending on the object studied.

140. According to the function where they are incurred, the costs can be operational costs or administrative costs.

141. To evaluate the different operations in relation to their contribution to the profit or loss, the port management must break down the activities into parts. The terms that are used to describe these parts of the port are service cost centres and productive cost centres. The distinction between the two types is clear. The service cost centre represents a defined function of the port which provides different sections with a service (e.g. the engineering department or general administration) but no productive activity is carried out. The productive cost centre also incurs costs, but in addition to its productive activity it generates revenue from dues and charges levied on vessels and goods. There could be many productive cost centres, each one representing a part of the port which for costing and accounting purposes can be clearly defined and treated as an entity. The cereal berths and granary, the roll-on, roll-off berths, the general cargo berths and conservancy departments all could be regarded as productive cost centres. It might be necessary for larger ports to have sub-centres within the main centres. For example, a port with many general cargo berths could divide this productive cost centre into several sub-cost centres, each one in the charge of a responsible manager or officer, and for example, comprising two general cargo berths, three portal cranes and one transit shed. These sub-centres could make up the general cargo productive cost centre.

142. The size of the port and the needs of management will determine the number and nature of cost centres and productive cost centres in the

organization. The process of breaking down the whole of the port into centres is important because it enables accountants to allocate the cost of resources consumed to the section which incurred them. It also places the person in charge of the centre with the responsibility of using these resources as effectively as possible.

143. Because all the centres, operating or service, are brought into the planning and budgeting process, that is, each centre or sub-centre submits its own budget when contemplating future traffic flows, these productive cost centres and cost centres are also known as "budget centres".

144. When breaking down the total figures in the balance sheet and revenue account into the various parts that go to make up the whole, we are entering into the sphere of cost accounting. In most businesses including ports, it is not very difficult to identify the sources of income. The various operating sections[1/] of the port have little difficulty in calculating the income they have earned during the year. Revenue from conservancy, cargo handling, plant hire, rentals, etc., can be readily ascertained from bills rendered to port users, but it is difficult to identify the actual costs incurred in providing the resources necessary to satisfy customers' requirements. The managers of the port must know these costs. If these are not known - and in many ports, large and small, they are not - then managers may be inadvertently handling or storing cargo at a loss and so running down the assets of the port. For every $1 received in income they might well be incurring costs that total $1.20. The financial picture of the port operations can be shown in the illustration (figure 10). Unless the port is purpose-built for one trade, e.g. an iron-ore berth, oil terminal, etc., it is almost certain to handle many types of cargo. In that case we can illustrate the financial situation something like this: (see figure 11).

145. Notice that now the income has been spread over the various operating centres of the port. This income has been allocated and summarized from bills rendered to port users, and as already mentioned, this is not difficult to do. Some of these centres may need special facilities.

146. The physical needs of the roll-on, roll-off berth are very different from those of the cereal berth and silo. So the capital costs of the berths and the operational costs vary. The same would be true of the other

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1/ Operating sections here mean income-earning sections, as distinct from service sections, which incur costs but generate no income.

FIGURE 10

PORT OPERATIONS SEEN IN FINANCIAL TERMS

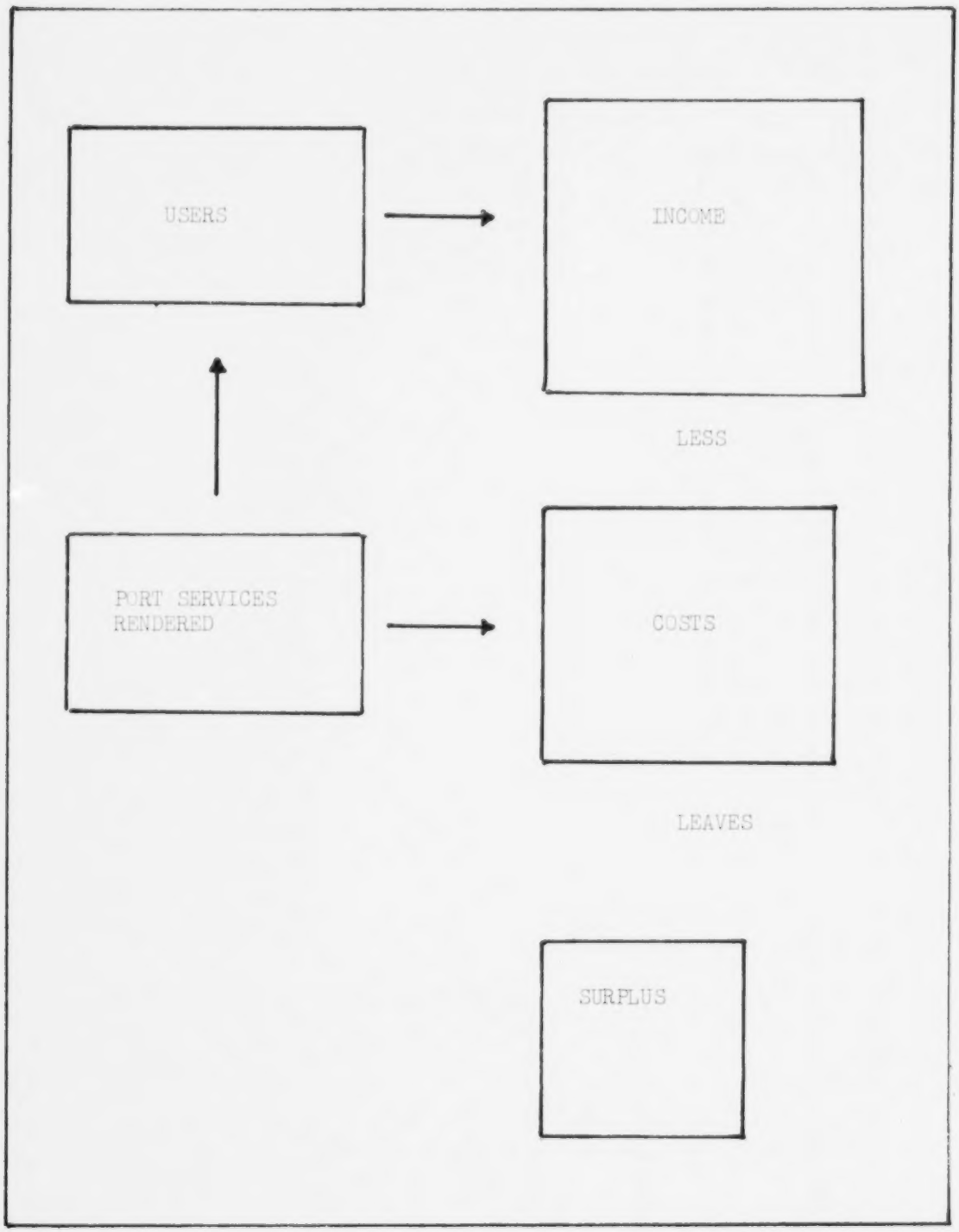
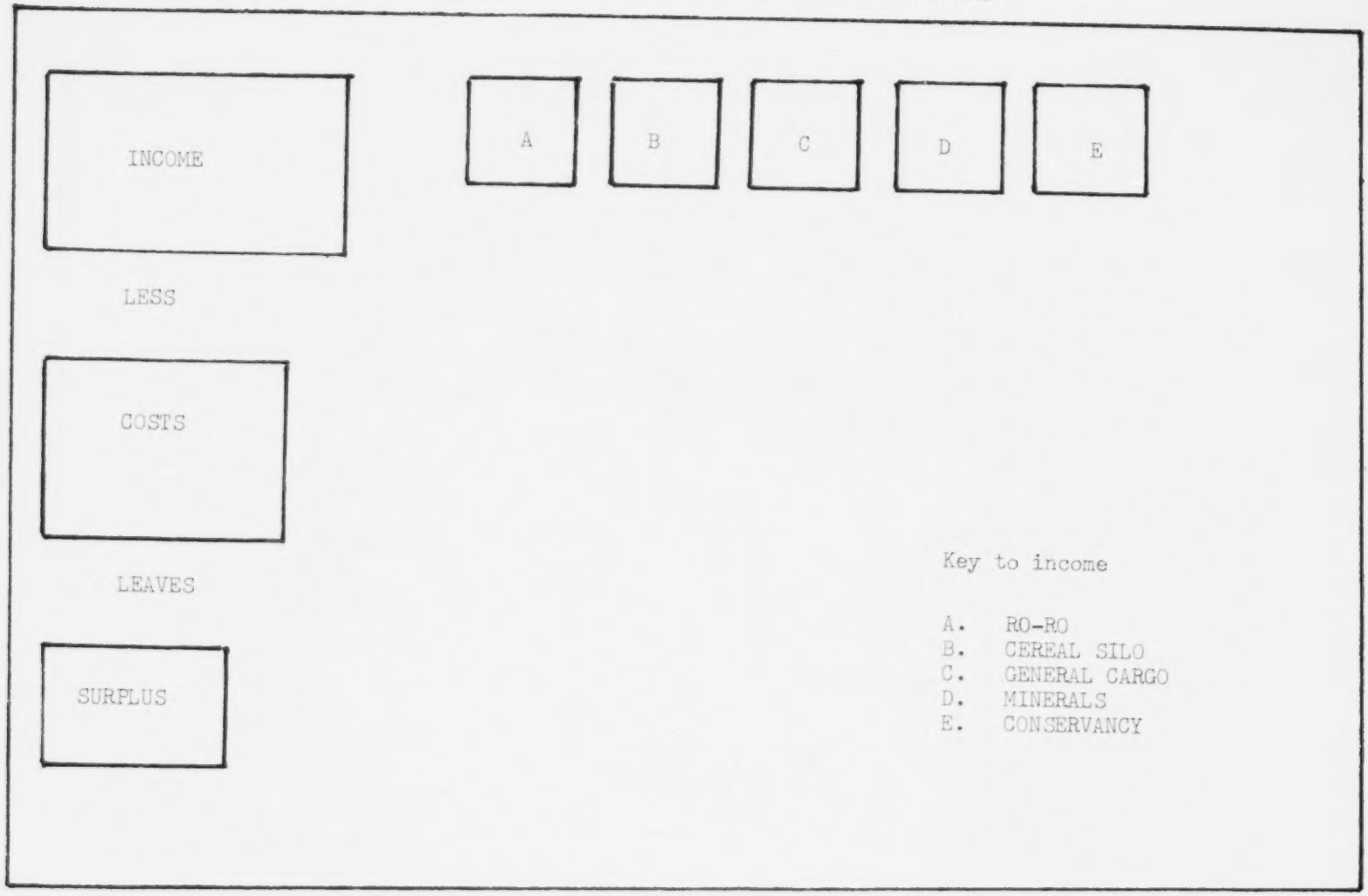


Figure 11

PORT REVENUE STATEMENT. ANALYSIS OF INCOME



port facilities. In addition, there would be many other costs, labour, materials, etc., consumed by each section. We can illustrate the situation by indicating costs that are incurred by the facilities of the port. For a visual picture of the income and expenses arising from the operating and service activities of the port see illustration (figure 12).

147. Two of the departments of the port are non-income earning. The engineering and the administration departments are essential to the running of the port. They incur costs as a result of their activities but earn little or no income. It is possible for the engineering department to undertake work for outside interests. Similarly, the general administration department might receive an income from outside organizations by, say, leasing out computer time. However, in financial terms, these are usually minor transactions.

148. So we need to identify the costs incurred in operating the facilities of the port. To do this we must understand the nature of costs. If we examine the different items that go to make up the total shown by the revenue account, we find that costs fall into four main categories. Each facility of the business incurs -

Direct costs - and these may be -
- Variable, or
- Fixed

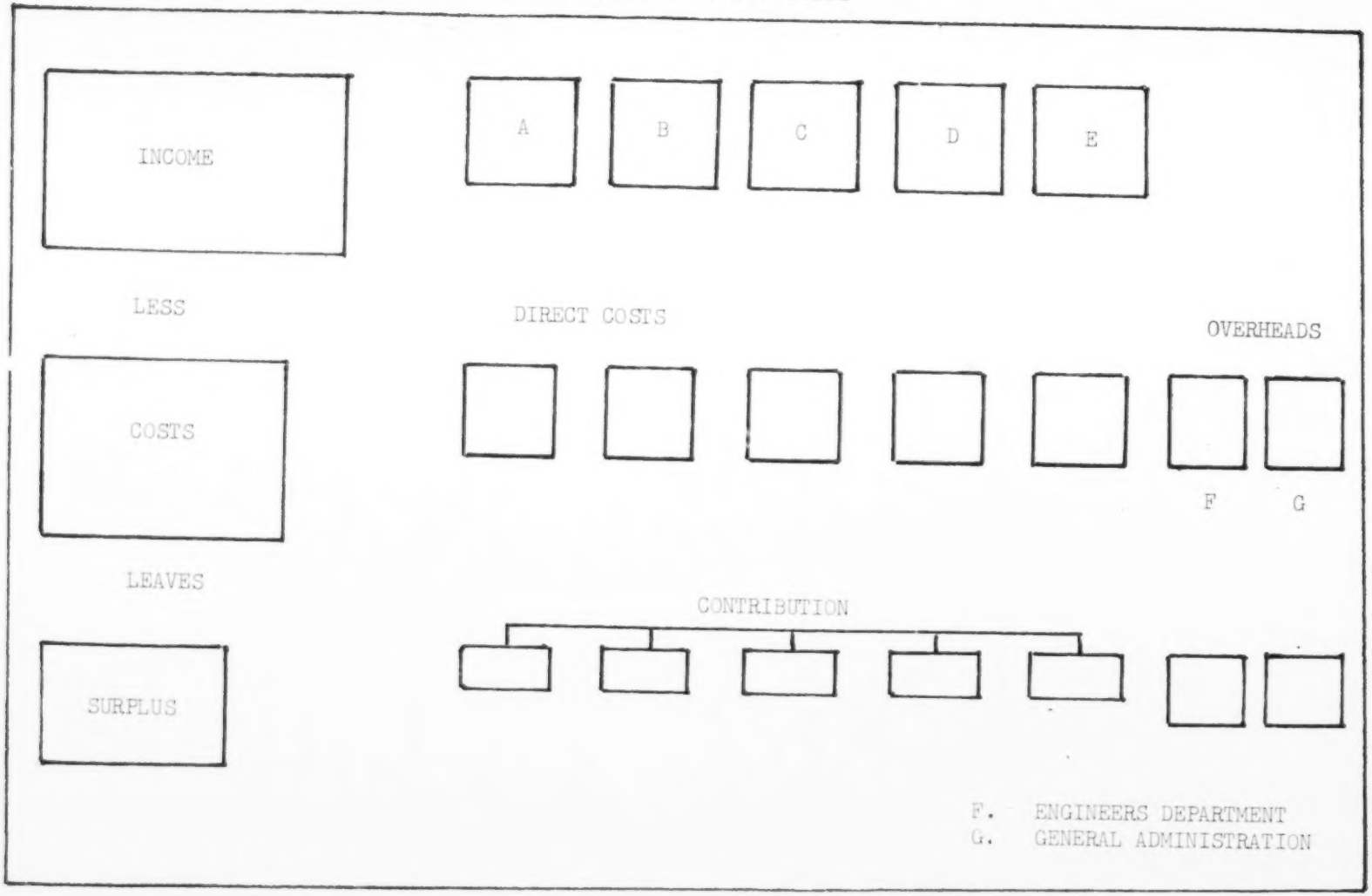
Indirect costs - also
- Variable, or
- Fixed

149. Some of these costs can be allocated directly to the facility or service concerned. The salaries and wages of the staff, together with all labour-related costs, such as national health insurance, pensions contributions, welfare, etc., will be a direct charge to one of the seven departments shown as cost centres (see figure 12). The same is true of many other costs which can be directly related to a cost centre. These include lighting, heating, insurance, power, stores, depreciation of capital assets, etc. Further examination of these costs show that some are variable and rise or fall with the level of activity arising from the cost centre - such variable costs would include electric power, fuel, materials. If the port pays its cargo handling staff on a piece-work basis, then dock labour costs would also rise or fall with the tonnage handled.

150. Other costs are, in the short term of one year, relatively fixed, e.g. insurance, depreciation of capital assets, licences, salaries of

Figure 12

PORT REVENUE STATEMENT.ANALYSIS OF
INCOME AND DIRECT COSTS



permanent administrative staff and manager, etc. In addition to those direct costs, there are costs which cannot be so easily allocated to a centre. For example, security personnel provide protection for the entire port and cannot be identified with any one facility. The same situation arises when considering the repair and maintenance of the roads and other infrastructure of the port. The whole port benefits from this work and it would be virtually impossible to allocate accurately to any one or more cost centres.

151. In the diagram (figure 12) direct costs have been charged to the appropriate cost centre. Those costs that cannot be directly related to a centre have been allocated to the service departments, e.g. engineering and administration. Where either of these two centres has carried out work specifically for another cost centre, e.g. the civil engineering department making good storm damage to a warehouse, or the computer carrying out a special task on behalf of, say, the conservancy department, these costs have been charged out to the departments concerned.

152. Lacking income (other than minor sums which port users might pay them for services rendered), the costs of the engineering department and general administration are collectively called 'overheads'. These overheads, or 'burden' as they are sometimes called, have to be absorbed by the income earning departments before the port can show a profit.

153. It is vitally important that the significance of the nature of costs is understood by management. One of their most important functions is to control costs. All costs have to be controlled in the long term but it is the variable costs that need prompt and regular scrutiny. Insurance, utilities, depreciation, licences, rents (if any are payable) alter very little during the period of one year. On the other hand, cargo handling costs power and materials consumed change every day as the services of the port respond to the traffic brought in by the port users. It is in this area that costs can get out of hand very quickly and close control is necessary.

154. Now the illustration can be taken one step further (see figure 12). A new term enters into the study of income and costs - contribution. This term is used to describe the difference between income and direct variable costs. The contribution generated by each income/cost centre is set off against the fixed costs of its own centre and then against the costs of the non-income earning service centres. In the illustration (figure 12) this means, as before, the engineering department and the general administration centre.

155. The overheads or burden of a port are a major item of expenditure. Since they are incurred for the benefit of all departments, some accountants consider that it is right for each operating section to bear a proportion of the overheads. This is called "full" or "total" costing. The idea behind this approach is to make the management of each income/cost centre aware of the heavy expenditure incurred on administration, port security, port promotion activities and maintenance etc.

156. It is difficult to find a formula that will allocate overheads on some basis considered fair and acceptable to all. Managers might resent large sums appearing in their income/cost statements over which they have no control.

157. Some accountants apportion overheads on the basis of tonnage throughput, income or number of persons employed in the section. Another basis of spreading the "burden" could be the ratio of total direct costs of each income/cost centre to the total of <u>all</u> direct costs of these centres.

<u>Example</u>

	Income/cost centres		Direct costs $million	Overheads % charged to centres
A.	RO/RO		2.5	10%
B.	CEREALS		2.5	10%
C.	GENERAL		12.5	50%
D.	MINERALS		5.0	20%
E.	CONSERVANCY		2.5	10%
		TOTAL	25.00	100%

158. This method of apportioning overheads has its weaknesses. For example, the conservancy productive/cost centre may have high direct costs because it has expensive specialized equipment (like dredgers) and highly skilled personnel such as hydrographic engineers, maritime officers, etc. These costs would be direct to the conservancy cost unit and included in the $2.5 million above. It is most unlikely that this centre would require 10 per cent of the engineering and administrative resources of the port, particularly when all direct costs are already included in the $2.5 million shown above. The manager of this department might complain that he was carrying too high a proportion of overheads and this could be a demotivating factor in his department.

159. Total costing can distort the contribution that productive/cost centres make to the net surplus of the port. (We illustrate the point in figure 13).

160. Note that the costs of centres F and G have now been absorbed by the five income earning centres. They were apportioned over the operating centres A to E on a formula which management considered acceptable and fair. Now, however, productive/cost centre D is showing a deficit instead of a surplus. Should the port regard this as indicating that D needs to be closed down?

161. Remember that under this system of total or full costing the mineral berth could show a deficit every year. Berths have been closed on such evidence. Clearly, it would be wrong to close down the mineral berth because, as we know, it is making a contribution towards recovering overheads. Except for maintenance costs, it is most unlikely that such a closure would materially affect the level of port overheads. If the mineral berth were closed down and the traffic could not be handled elsewhere in the port, the traffic would be lost to the port and the overheads once apportioned to D would have to be carried by the remaining income earning centres.

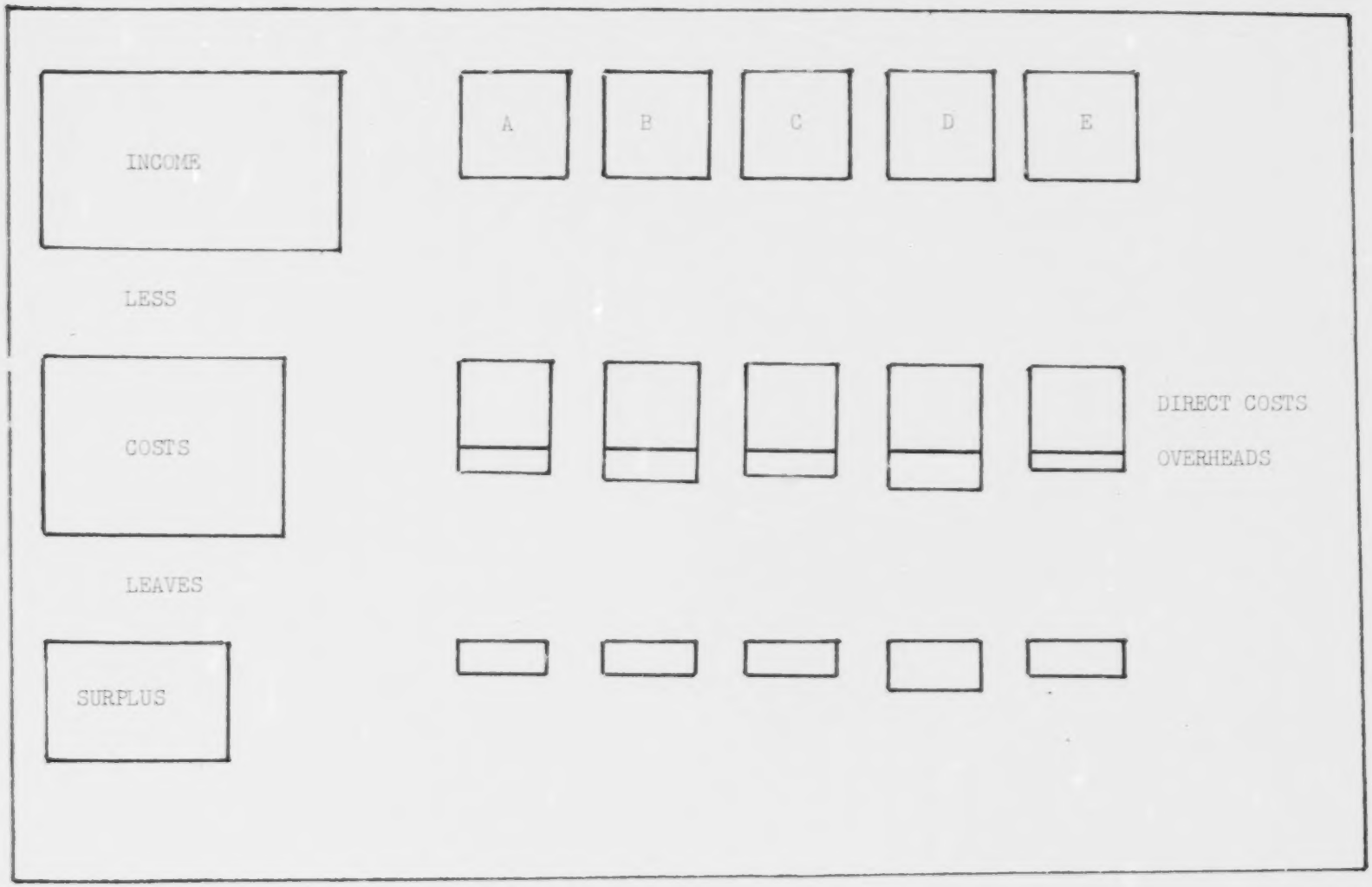
162. So management needs to know the income and direct costs of each centre. It also needs to relate these to the throughput of cargo. In the general cargo berths the many different types of traffic handled would incur different levels of cost. On the same berth, even the same commodity might be loaded and discharged at different costs. For instance, pre-palletised cases of fruit would be easier and therefore cheaper to load or discharge than non-palletised cases of the same commodity. The physical characteristics of cargoes differ. A tonne of sisal would have very different handling costs from those incurred in handling a tonne of strip steel. Both of these commodities, and many others equally different in their physical properties could pass over general cargo berths. So it is not only necessary to know the income and costs of an operating centre. It is also necessary to break down this information in respect of different commodities. When the costs of different commodities are known for discharging, loading, delivering or transporting to transit sheds, this information is the basis upon which tariffs should be calculated.

163. The process of ascertaining the resources needed to handle cargo, i.e. number of men, cranes, trucks, etc., is known as work study.

164. When a number of different ships discharging say, sisal, fruit or strip steel, have been observed and the necessary resources needed to perform this task have been measured, a <u>standard</u> cost to the port can be calculated

Figure 13

PORT REVENUE STATEMENT, ANALYSIS OF INCOME OVERHEADS
ALLOCATED TO OPERATING DEPARTMENTS



for each commodity. This standard would say, in effect, from our observations we calculate that 16 men on ship and quay with one crane and four fork-lift trucks can discharge or load x tonnes per hour. In practice, costs would be set up for groups of cargoes which have similar handling characteristics. Cases of fruit and cases of detergent in plastic containers may need similar handling resources. They would therefore be grouped together under one tariff heading. Standards, based on work study, would be calculated for each group of commodities. When quantified in money terms, a standard cost would be known for all the commodities that regularly pass through the port.

165. So as to ascertain the cost of the services and facilities provided by the port for its customers, it is necessary to analyse the total port incomes and expenditures and to allocate them to the centres where they were generated. (See figure 12).

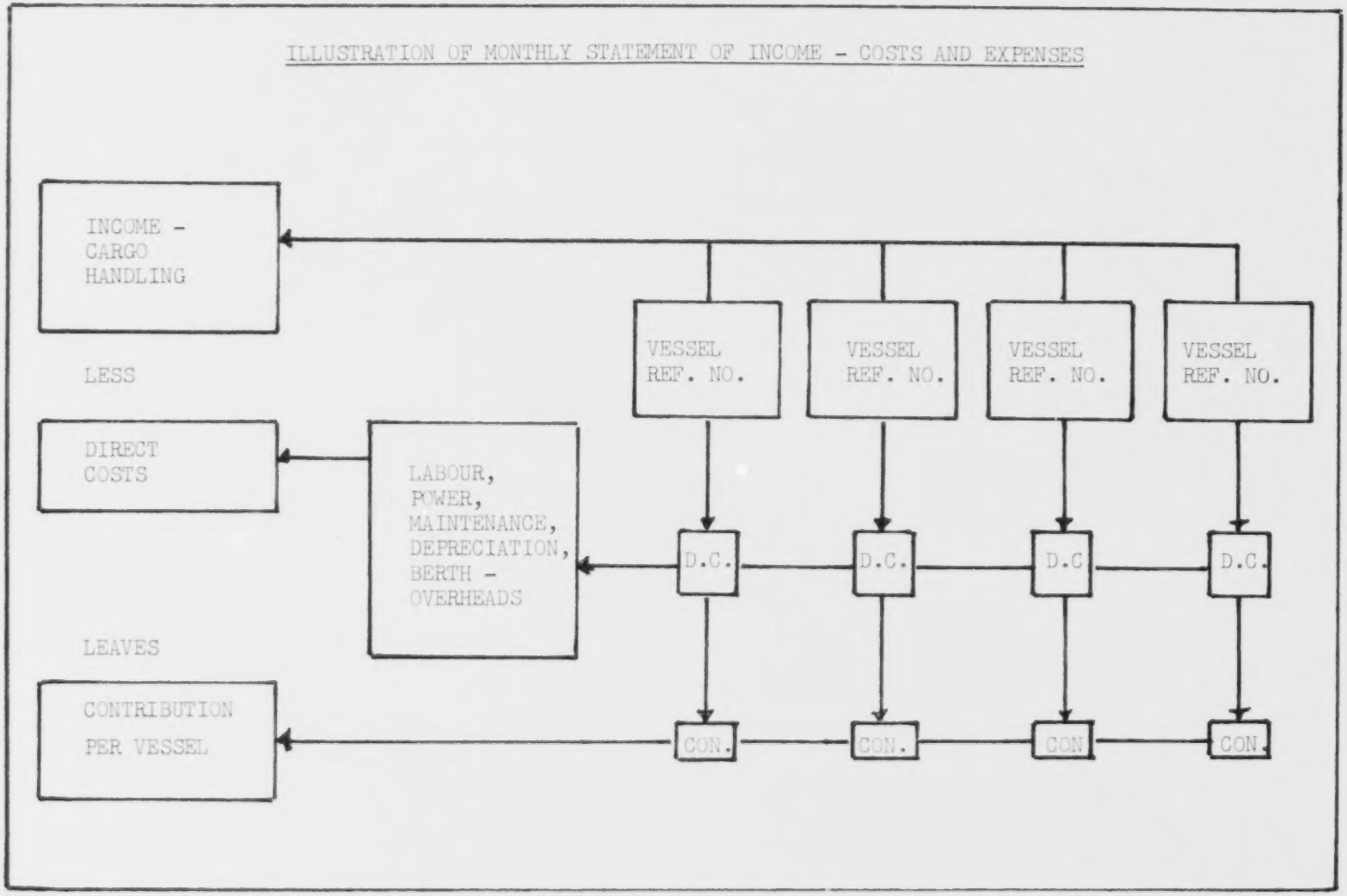
166. The accounting system must be structured to meet this need and provide the necessary information for the control centre managers. So in addition to the financial accounting system, which, as already explained provides regular information to management on the position of assets, liabilities, income costs and expenses, an analysis and re-allocation of that information is provided by the Management Accounting system.

167. Emphasis has already been placed upon the importance of an acceptable contribution from each productive/cost centre. To maximize his contribution, the control centre manager must have details of the income, costs and expenses generated by his operations. To do this, the activities of his centre must be analysed and summarized in financial terms so that income, costs and expenses can be allocated for each vessel or parcel of cargo handled. (See figure 14).

168. The role of the accountant can be seen, now, as one that covers two distinct areas. In financial (and in ratio analysis etc.) and statistical terms, it provides the basic financial records in which are reflected the continuous and total activities of the port, what it owns and what it owes. For management planning and control, its second function is to analyse, summarize and allocate the financial information to the relevant productive/cost centres (control centres). A further sub-division of the data for each centre is to relate the income and costs to each separate activity, that is, each vessel or quantity of cargo handled.

Figure 14

INCOME COST CONTROL CENTRE - MINERAL BERTHS



169. Finally, managers of control centres, with the assistance of the management accountant, use the information in the system, and relevant information outside these records, to forecast income, costs and expenses for future operations of their department. Taking into consideration fixed costs and variable costs, budgets can be compiled for each centre.

Chapter III

FINANCIAL BUDGETS

170. The task of management is to:

(1)	Set aims and objectives	(5)	Co-ordinate
(2)	Plan	(6)	Control
(3)	Initiate	(7)	Measure
(4)	Communicate	(8)	Assess
		(9)	Re-plan if necessary

171. In order to carry out these duties, and achieve the objectives set for the port, managers must plan for the future and not respond solely to events as they occur. They must be creative in approach, identify opportunities well in advance and so react in a way most beneficial to the port and the community.

172. Financial planning for the future can be divided into three main areas:

1) Short-term profit planning - usually for one year ahead - the Revenue Budget.
2) Long-term planning, perhaps covering 10 or 15 years, including the construction and purchase of capital or major assets - capital budgeting.
3) Cash budgeting, which involves scheduling future inflows and outflows of cash arising from (1) and (2) above as well as the borrowing and repayment of loans, sale of major assets etc.

173. In the following pages we cover only the aspects of short-term profit planning and cash budgeting, as the long-term planning is comprehensively discussed in other UNCTAD publications.[1/]

174. Profit planning over a number of years can be scheduled in such a manner that, for example, in a five-year budget, as each separate year passes, that year is dropped from the budget, year number 5 becomes year number 4, and another budget year, year 6, enters the schedule as year 5. This is called a rolling budget.

1/ See, for example, "Appraisal of port investments" (TD/B/C.4/174), and Port development, A handbook for planners in developing countries, United Nations publication, Sales No. E.77.II.D.8.

Example: Five year rolling budget

Current year	Years ahead 1	2	3	4	5
Current year	1	2	3	4	5
Current year	1	2	3	4	5

175. The detail in each year for such a profit budget must necessarily be entered in general terms for the years ahead 3, 4 and 5, but is amended and detailed as each new year approaches and, for example, the budget that once was for year 3 becomes the budget for year 2. Because of the uncertainty which is always present when planning for the future, even the year immediately ahead will contain forecasts of income and expenditure which allow for differing levels of trade. This is called Flexible Budgeting.

The annual revenue budget

176. The annual profit or revenue budget for a 12-month period, starting perhaps on 1 January, must be based on a traffic forecast provided by the commercial department. Such a forecast should indicate the most likely pattern of trade and list which commodities are expected to pass through the port, when they could arrive, and whether they will be import, export or coastwise traffic. This information assists the harbour master in consultation with the cargo handling manager to draw up his berthing schedules. The commercial department (sometimes called the marketing department) should complete its forecasts by the end of the August prior to the budget year. Information is usually compiled from port records which cover the traffic trends for the last few years, together with any information obtainable from governments, trade associations, foreign trade missions, economists etc. The marketing department should not shirk responsibility for providing as accurate a forecast as is possible, but cannot be held responsible for changes in the pattern of trade outside its control. A poor harvest, a cold winter, or an economic depression could make nonsense of such forecasts. Due allowance should be given for such events should they occur, when comparing budgeted traffic with actual traffic. Nevertheless, should an anticipated traffic fail to materialize, the task must be to replace it with another.

177. From the marketing department's traffic forecast, which should specify commodities, tariffs, quantities, and the time expected at the port, the revenue budget of the port can be compiled. The first step is to lay the trade forecast before the budget committee. This committee, which should comprise individuals drawn from the different functions of the port - conservancy, marketing, engineering, cargo handling, administration, etc. - is presided over by a chairman and serviced by the committee secretary. The committee would include the management accountant, whose task it is to collate, publish and explain the regular budget reports. The traffic forecasts indicate the facilities required to handle the cargoes and the area of the port (cost centre) best suited for this task. They indicate the level of costs and expenses management must expect to meet during the coming year.

178. Where standard costs have been computed for classes or groups of cargoes, these greatly assist in calculating the total resources needed to service the traffic. As already noted in all but purpose built, one commodity ports, e.g. oil terminals, traffic usually consists of many different cargoes and is consequently handled in different parts of the port, i.e. different income/cost centres. With the forecasts before them, the budget committee would allocate the traffic over the various sections of the port. The officers in charge of these centres then assess the resources they can command against the traffic they are expected to handle. The resources may or may not be adequate. At this point the person responsible for servicing the trade will itemise the assets required to accomplish his part of the work. This is the first step in preparing the annual revenue budget. The income arising from this traffic will be calculated by the marketing department. Each productive/cost centre of the port scheduled to handle the cargo, having reviewed its resources and drawn up its own budget in physical terms, then requires the management accountant and his staff to translate this into financial terms. These preliminary budgets are sent to the budget committee for discussion and assessment, preferably before the end of September. The centres concerned with the traffic forecasts are operating and income producing sections of the port. Their income reflects the volume of traffic multiplied by the tariff rates. Their expenditure is partly fixed, because of minimum staff levels and assets required, and partly variable, in respect of costs related to tonnage throughput and wage rates.

179. In addition to these are the service centres - or cost centres - whose task it is to provide the services required for the port to operate effectively. Administration and engineering (mechanical, civil and

electrical) are the two largest service centres without which the port could not operate and these are responsible for a high proportion of the total costs of the organization. These departments submit their budgets along with the income/operating sections. Unlike income/operating budgets, which tend to rise or fall with the volume of traffic, the call of service centres upon resources tends to remain reasonably stable in the short term. But it is obvious that a rise in the general level of prices might result in a much bigger financial budget than that of the previous year. So the budgets for all the separate sections of the port will respond differently to the traffic forecast according to whether they are income earning or service departments.

Concept of contribution

180. When all productive and service centres have submitted their budgets for assessment and discussion, these are summarized and totalled so that top management can get the picture of the port's finances for the coming year. Almost certainly these preliminary budgets will require amendment if only because, by the end of September, facts and figures are now known which were not available when the budget was first drafted. For example, a wage settlement with the staff might have been finalized and actual wage rates for the next year could be substituted for estimates used in the preliminary budget preparation. In addition to such adjustments, the whole revenue budget must be studied in the light of the aims and objectives set by top management. The overall picture projected by the budget summary may reveal an unacceptably low excess of income over expenditure. Decisions may have to be taken to increase the contributions generated by the income cost centres.

181. It may be necessary to achieve this by:

(1) Raising tariffs.
(2) Intensifying the search for new trade.
(3) Postponing expenditure on new capital assets and making do with existing resources.
(4) Carefully scrutinising the budget expenditure for the service centres to ascertain whether all is absolutely necessary.

182. Any amendments deemed necessary by the budget committee must be agreed with the manager of the section or department concerned. If staff are to identify themselves with the port and its aims and are in responsible positions to further or obstruct the fulfilment of those aims, they must

approve the resources allocated to them. They will then be more likely to feel motivated to accept responsibility for accomplishing tasks in hand with the resources allotted to them and which they have agreed are adequate. If arbitrary decisions are taken by the committee and budgets cut without the agreement of the manager concerned, he has no incentive to see that actual expenditure does not outrun his budget. There will be times when agreement is virtually impossible because of differences of opinion about the resources needed to accomplish a given task. In such cases compromise might be effected by postponing desirable but not vitally important expenditure on such items as new furniture, cars or minor building maintenance. As a corollary to this, work study or organization and method study could be employed to resolve the dispute when the task in dispute is undertaken.

Cash budget

183. In addition to the revenue budget, there will exist plans for the purchase of new assets, extensions of old facilities, repayment of loans falling due in the coming year etc., and these must be consolidated into one picture of cash flow.

184. In the cash flow budget which is constructed from the revenue budget together with the capital budget and other financial transactions, all items of a non-cash nature, such as depreciation, are omitted. Many costs are incurred in one month and may be paid for during the next month or two. Similarly, income may be generated in one month and received at some later date. In a cash budget, all entries are scheduled in the month in which they are to be paid or received. The cash budget is essential to management because it gives prior notice of cash surpluses or deficits arising from the scheduled activities of the port. It will also indicate the month or months in which these surpluses or deficits will occur. Management is thus forewarned well in advance of the cash flow during the coming budget period. Arrangements can be made to profitably utilise cash surpluses or in the event of a deficit seek loans on the most favourable terms.

185. The compilation of these budgets will have involved detailed discussions between all departments and the budget committee. In itself this is an excellent exercise in communication and, one hopes, motivation. When completed, the budget should be published not later than in the last month of the pre-budget year. Distribution of this budget will depend on management policy. The manager or supervisor of an income/cost centre comprising six general cargo berths and two transit sheds may not be interested in the conservancy department's budget. He will certainly be interested in the

budgets of other general cargo income/cost centres and those of dock administration and engineering, as part of the budgets of both of these service centres will be charged directly to his own budget. Managers should not be swamped by reports and figures which do not concern them. Distribution should be based on a policy which ensures that only that budget information should reach his desk which is helpful to him in his job. Clearly, departmental managers will be concerned with their own budget and all the sub-centre budgets from sections under their control. The Chief Executives and Board of Directors will receive the total budget for the port and have access to all supporting budgets and other relevant data. In a large port this is a formidable document. The aim of providing good management information at all levels should never be overlooked. Keep it relevant and keep it brief.

186. When distributed, the revenue budget forms a control instrument. As each month proceeds, the actual income and expenditure is compared with the budget. Any exceptional variance between budget and actual can then be investigated to ascertain how and why the variance arose. The process of preparing the "feed back" reports is the responsibility of the management accountant. Managers whose centre or centres under their control are materially moving off budget will explain the reason to the management accountant or if necessary to the budget committee.

187. In this way the control function comes into action. By responding promptly to any deviation from the budget, management can take corrective action. Possibly traffic has fallen below expectations. The marketing department should endeavour to fill the gap. Perhaps more traffic arrived at the port than was expected and, to avoid congestion or delay, extra shifts worked. Fuel costs may have risen unexpectedly and these would be outside the control of the port management. In this event, efforts should be made to find ways of economising on the fuel consumed or perhaps find an alternative source of power. So month by month management should be watching to see that the port is achieving its objectives and, if it is not, deciding the corrective action to be taken.

188. A properly designed and organized budgetary control system, when understood and supported by the staff, should contribute positively and constructively to the efficient working of the port. It should never cost more to operate than the benefits it confers on the organization and must never act as a straight-jacket by being restrictive when it should encourage initiative and innovation. It should provide a valuable means of communication between all port staff and operate in a way designed to motivate them to work towards the port's objectives.

189. Many budgetary control systems are mistrusted and misunderstood by staff and therefore fail to provide the benefits that they could for the organization which maintains them. Invariably, this mistrust occurs because the system has been imposed on reluctant staff who see it in more work and reams of seemingly useless reports to read and comprehend. The information is often ignored by the recipients because it is not presented in a meaningful way. The system should be designed to provide the information required by the staff who, from supervisors to chief executives, should have a clear idea of the kind of report that will best help them in their duties. The frequency of report distribution is very important. Cargo handling managers, for instance, want prompt daily information giving reports on the progress of cargo. Civil engineers, on the other hand, for control purposes could work with monthly budget reports.

190. Managers will be influenced by the design of report forms. Too often poorly designed forms dissipate motivation, efficiency and enthusiasm. It is better to delay the introduction of a management information system in order to get a good one rather than install an inferior one in a hurry and cause future impatience and frustration.

191. One other very important aspect of budgeting must be remembered. Businesses are living, dynamic organizations. This movement leads to change, and after a few years report systems fail to reflect these changes. At regular intervals the budgeting system should be reviewed and any necessary changes made to bring it in to line with developments in the organization.

Chapter IV

WAYS OF IMPROVING THE FINANCIAL SITUATION

192. A manager is one who, by his decisions and actions, can influence the quantity of resources consumed to accomplish a given task. In our present society, and specifically in ports, the emphasis on bigger organisations, more sophisticated equipment, modern techniques and general pressure to speed up the pace of operations is one that can daunt the ablest manager into feeling that any contribution he can make to the better running of his port must be minimal. The day-to-day responsibilities of coping with his job are such that he has little opportunity to ask himself or others "Is this the best way to do the work and achieve our objectives?".

193. This chapter considers the way in which managers can beneficially influence the financial situation of a port.

194. The need for an acceptable and sustainable return on assets employed in the business has already been emphasized. If the current profit is too low when measured against capital employed, there are two distinct areas which need investigation.

195. Return on capital employed can be measured by comparing the revenue surplus or profit with the net assets employed. The return can be improved by (1) increasing the profit or
(2) decreasing the capital

Example $\frac{\text{Surplus \$1 million}}{\text{Capital \$10 million}}$ = 10% return

Objective of management = 12½%

Then raise surplus to $\frac{\$1.25 \text{ million}}{\$10 \text{ million}}$ = 12½%

or decrease capital to $\frac{\$1 \text{ million}}{\$8 \text{ million}}$ = 12½%

196. Experience has shown that a thorough scrutiny into the income, costs and expenses which make up the revenue surplus and into the net assets employed, invariably yields benefits in both areas.

197. A start should be made by a rigorous examination of all the capital or fixed assets belonging to the port. The question should be asked, "Do

we need all these assets to service our traffic?". Management may compare its investment in these long-term assets and tonnage throughput with those of comparable ports. The report by the UNCTAD secretariat Port performance indicators[1] sets out a number of performance ratios such as:-

$$\frac{\text{Capital equipment \$M .....}}{\text{Tons of cargo handled .....}}$$

and these would be relevant to this point. Changes in working procedures may make it possible to reduce the number of berths, cranes, floating craft, equipment and vehicles used in the port. If reductions can be made in these assets, they can be scrapped and sold. The port would receive a welcome flow of funds available for distribution to owners and creditors and the base figure, i.e. capital employed, in our ratio reduced. At the same time, depreciation, maintenance and other costs, such as garaging and stock-holding of spares, would be eliminated from revenue costs and so improve the profit figure.

198. If the exercise described above is successful and reductions are made in the capital assets employed, management and staff will have reduced the drain upon resources which has operated over past years. This will in turn improve earnings in future years. In addition to this gain, the exercise should prompt management to question and investigate decisions which are currently being taken and which could lead to a reduced flow of expenditure by the port in future years. To control costs in the future it is necessary to evaluate their impact on ports now and before decisions are taken.

199. In this cost saving exercise, communication and co-operation between managers of different departments of the port is vital. The events described in the following paragraphs are by no means unique.

200. A port strengthened a berth and purchased a container crane to service its container traffic. Previously it had handled the containers with a scotch derrick. In addition to the container crane, the port studied the logistics of container handling and decided that it needed two straddle carriers on the berth to service the expected flow of traffic. By the time the berth had been operating for two years, the port had purchased, and was operating, four straddle carriers. There had been no increase in the forecast throughput of containers, and the doubling of investment in these carriers was due to low levels of availability for work of each carrier.

1/ TD/B/C.4/131/Supp.1/Rev.1, United Nations publication, Sales No. E.76.II.D.7.

201. Down-time for this equipment was far greater than expected because:

(1) The carriers were less robust in their construction than equipment previously used by berthworkers and were very susceptible to damage, particularly from unsuitable berth and stacking area surfaces.

(2) The sophisticated electronic and hydraulic mechanisms of these carriers was beyond the skills and knowledge of the port's engineering and maintenance staff.

(3) Spare parts were very expensive and the lead time from order to receipt of replacement parts was very much longer than anticipated. This led to the need for additional stocks of expensive spare parts. A new purpose-built workshop had to be built to enable the very tall carriers to be serviced safely and satisfactorily.

202. All the problems outlined above led to the doubling of expenditure on straddle carriers. Closer liaison between the various departments

Mechanical engineers	Purchasing officers
Training officers	Civil engineers

and capital investment project officers in the accounting department could have led to a thorough examination of the straddle carrier system and its problems and costs <u>before</u> investment, and reduced both the amount invested and the heavy maintenance costs that followed.

203. The event outlined above and the efforts that have to be made to solve them are typical of the problems facing port managers. When capital assets such as cranes, carriers, trucks and trailers are acquired, they load the port with higher capital investment and a regular maintenance cost in the revenue account. These two factors reduce the return on assets employed when it is the task of managers to improve that return.

204. After a rigorous examination of the capital assets employed by the port and the promotion of better inter-departmental communication, the attention of management should be towards stock levels and the purchasing procedures of the organization.

205. Stock represents money that has been spent on goods ranging from spare parts of machinery to stationery in the typists' office. It is an area which can generate losses to the port by:-

(1) Pilferage of stocks

(2) Investment in materials and spares no longer needed

(3) Overstocking due to poor buying and poor stock-keeping techniques.

206. Pilfering of materials can be very costly to organizations. Procedures should be enforced that prevent the unauthorized drawing of supplies. Frequent but unannounced stock checks of the most expensive items should be implemented from time to time by spot checks on the less valuable commodities carried in the stores. It is not unusual for a thorough examination of spare parts for plant and machinery to reveal spares being held for equipment no longer in use in the port.

207. Standardization of plant and equipment will save money. A proliferation of different makes of the same type of machine means that a greater number of records have to be kept by the store-keepers, and purchasing officers spend more time when buying from several suppliers rather than from one or two. Maintenance engineers have to work on several different machines, which makes it more difficult for them to use their skills and time in the best way possible. The stores coding system needs more reference because of the variety of spares. All these factors add unnecessarily to the number of records kept and the entries made in them by the staff. Errors in coding requisitions invariably increase. Standardization of assets and procedures can be extended into many departments. Typewriters, accounting machines, calculators and forms of all kinds should be standard as far as is possible, and this will ease the tasks of purchasing, maintaining and stock carrying. Moreover, standardization assists in the level of stocks carried since a smaller quantity of each item need be carried. This will mean a smaller investment in net assets and release funds for investment elsewhere.

208. Debtors can absorb a very large proportion of the total funds of a port. The debt figure represents money owed to the port for services rendered to port users. It reflects the amount of cash belonging to the port and held as some other organization's asset. Management policy in respect of these outstanding debts must be formulated and known to port staff and to port users. There are a variety of ways in which ports endeavour to speed up the collection of dues and charges levied on customers and so keep debts to a minimum. Some ports refuse to let vessels sail until all ships' charges and dues are paid. The same rule is applied to charges for cargo handling on ship, quay or warehouse.

209. No ship should leave the port until cash is deposited on account of the bills to be rendered. When ships' bills of lading are received in advance of the ships' arrival some ports immediately issue bills to the cargo owners or agents based on information contained in the bills of lading. Deposits are required in line with the bills issued. When the

vessel has finished discharging, errors or omissions are corrected and the final accounts settled. Again, in order to save work and time, some ports will only do business with a limited number of agents acting for ships or their cargo. The procedure is for the port to bill the agents, who then have the task of reimbursing themselves from the shipping companies and cargo owners.

210. There must always be a fine balance between putting pressure upon customers to settle their accounts promptly and encouraging them to use the port. This is particularly so where ports are competing for trade. Again, many amounts outstanding arise because of disputes about out-turn, weight or damage. From management's viewpoint, there should be a good reason for all the amounts unpaid. The amount due from debtors should never be allowed to rise or remain at too high a level through the slackness of port procedures and staff.

211. The channels of communication between sheds, quays, warehouses, etc. should be reviewed from time to time. If procedures are such that it usually takes 14 days to issue bills to customers when, with better organization, bills could be issued in 7 days, then debtors are given 7 days longer than necessary to settle accounts, since bills are customarily due some time "following receipt of invoice".

212. Cash surplus to immediate requirements should be placed on deposit. Accurate cash planning and budgeting enables managers to assess the balance they need from week to week and then find use for surplus funds. When the figure representing net assets employed has been reduced by measures outlined above, then the profit or net surplus in the revenue account requires attention.

213. Many costs are mandatory. If cargo is to be handled, costs automatically arise for labour, power, fuel, etc. Other costs arise from past policy decisions taken by management. Port position, and the number and size of buildings and quays, all create an outflow of cash which cannot be easily changed. The critical area in which managers should exercise vigilance is when expenditure is presented for approval and <u>before</u> the money is spent. New developments in modern sea transport systems have imposed heavy expenditure for the acquisition of the available sophisticated equipment, from container berths to computers. These acquisitions are individually appraised by the usual discounted cash flow techniques and in themselves may justify their cost.

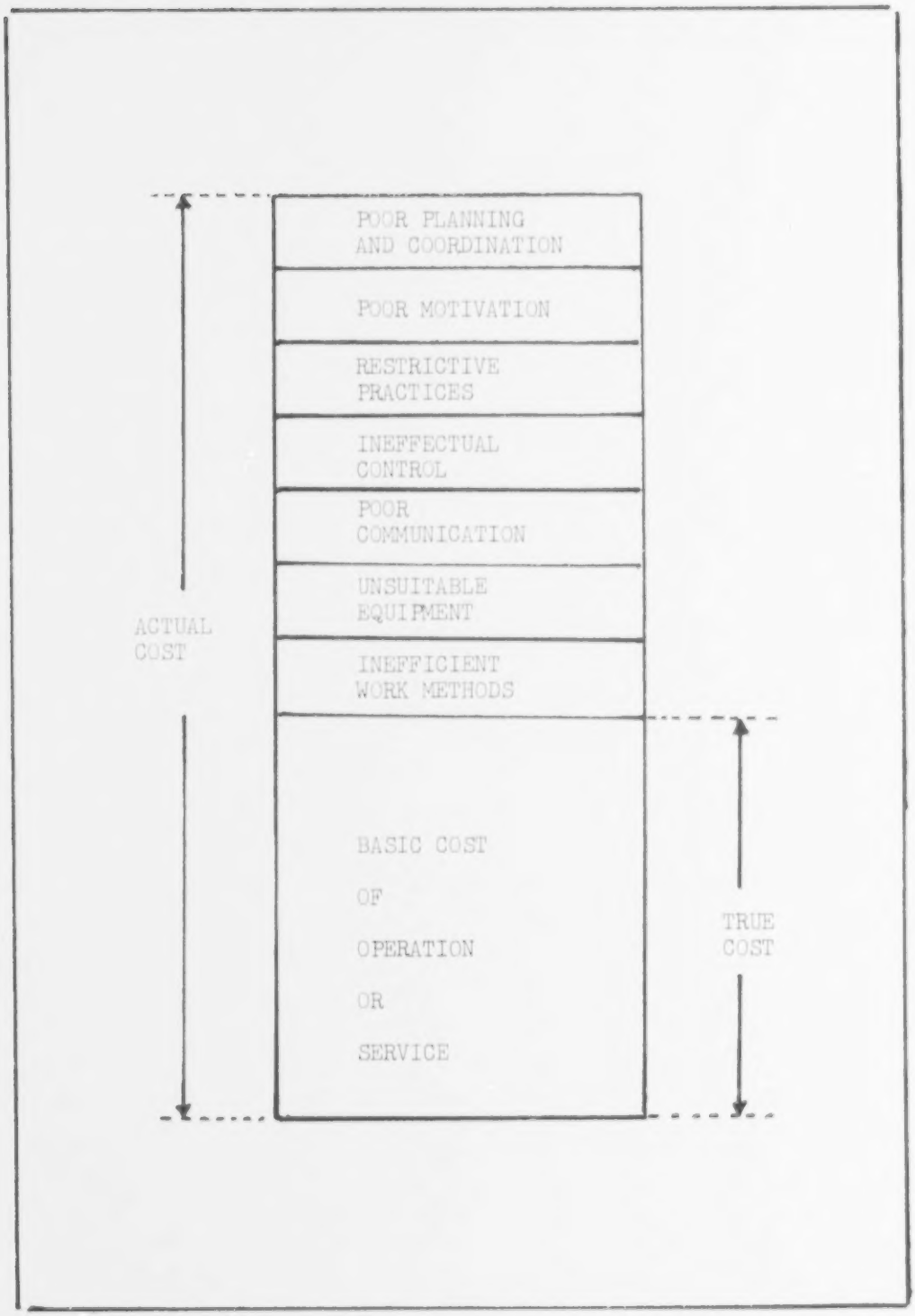
214. It is in the back-up and ancillary services, which tend to get overlooked in the first flush of modernization, that the danger of wasting resources occurs. The new technology, whether in the operating field or the administration field, brings in extra staff. Unless managers have the necessary expertise to evaluate staff requirements and supportive resources, expenditure can increase and persist unnecessarily, even alarmingly, and will need prompt action. Bigger port facilities often mean larger port areas and longer lines of communication. The problems arising are often made good by engaging extra staff.

215. In many organizations this "empire building" is actively encouraged by management, who reward heads of departments - in part at least - by counting departmental staff rather than by the real contribution to the effective running of the port.

216. True costs are seldom quantifiable. Figure 15 indicates how the true costs are swollen by extra costs arising from bad or weak management. But it must always be remembered that to refine the cost of operations to a degree that reflected "true" cost would almost certainly give rise to greater expenditure than the savings which such information could generate.

Figure 15

FACTORS MAKING UP THE COST OF AN OPERATION
OR SERVICE



PART THREE

Case studies

Case study 1: Preparing a balance sheet

1. The accounts of Anyport (shown in table 4) present the following figures, and based on them a balance sheet has to be produced:

Table 4

Accounts of Anyport

	$'000
Long-term loans repayable 1992/97 - secured	43,250
Depreciation on docks and buildings to date	16,500
Stores and materials at cost	850
Trade creditors	5,000
Motor vehicles at cost	720
Debtors and prepayments	12,000
Creditors for capital expenditure	5,700
Docks and buildings at cost	87,750
Taxation payable	1,650
Floating craft at cost	8,600
Depreciation on plant and equipment to date	10,300
Land at cost	32,000
Owners capital - ordinary shares of $10 each	75,000
Depreciation on floating craft to date	2,700
Cash at bank and on deposit	7,900
Reserve - additional depreciation for replacement of fixed assets	6,500
Depreciation of motor vehicles to date	470
General reserve. Undistributed profits	11,250
Plant and equipment at cost	28,500

2. The first step is to identify the assets and liabilities represented by the accounts. It should be noted that depreciation accounts are not liabilities but complementary to fixed assets accounts, and this is why they are presented in the credit balances column together with other liabilities. The assets will be included under the column of debit balances. The result will be as shown in table 5.

Table 5

Accounts of Anyport showing credit and debit balances

$'000

Debit		Credit	
Stores and materials	850	Long-term loans	43,250
Motor vehicles	720	Depreciation docks and buildings	16,500
Debtors and prepayments	12,000	Trade creditors	5,000
Docks and buildings	87,750	Creditors for capital expenditures	5,700
Floating craft	8,600	Taxation payable	1,650
Land	32,000	Depreciation plant and equipment	10,300
Cash at bank and on deposit	7,900	Ordinary shares of $10 each	75,000
Plant and equipment	28,500	Depreciation floating craft	2,700
		Reserve - additional depreciation for replacement of fixed assets	6,500
		Depreciation motor vehicles	470
		General reserve undistributed profits	11,250
	178,320		178,320

3. Now the items can be arranged in order to produce the balance sheet. Two forms of presentation are included here: (see tables 6 and 7).

Table 6

Alternative A of balance sheet for Anyport

($'000)

Anyport - Balance sheet as at 31 December 1975

Current assets			**Current liabilities**	
Stores and materials at cost	850		Trade creditors	5,000
Debtors and prepayments	12,000		Creditors for capital expenditure	5,700
Cash at bank and on deposit	7,900	20,750	Taxation payable	1,650
				12,350
Fixed assets				
Land at cost		32,000	Long-term liabilities	
Docks and building at cost	87,750		Long-term loans - repayable 1992/97 secured	43,250
less depreciation to date	16,500	71,250		
Floating craft at cost	8,600		**Capital**	
less depreciation to date	2,700	5,900	Ordinary shares	75,000
Plant and equipment at cost	28,500		Reserve for replacement	6,500
less depreciation to date	10,300	18,200	Undistributed profits	11,250
Motor vehicles at cost	720			
less depreciation to date	470	250		
		127,600		92,750
TOTAL ASSETS		148,350	TOTAL LIABILITIES AND CAPITAL	148,350

Table 7

Alternative B of balance sheet for Anyport

Anyport - Balance sheet as at 31 December 1975
($'000)

Capital employed			
Fixed assets			
Land at cost			32,000
Docks and buildings - at cost		87,750	
Less depreciation to date		16,500	71,250
Floating craft - at cost		8,600	
Less depreciation to date		2,700	5,900
Plant and equipment - at cost		28,500	
Less depreciation to date		10,300	18,200
Motor vehicles - at cost		720	
Less depreciation to date		470	250
Total of fixed assets			127,600
Current assets			
Stores and materials at cost		850	
Debtors and prepayments		12,000	
Cash at bank and on deposit		7,900	
		20,750	
Less current liabilities			
Trade creditors	5,000		
Creditors for capital expenditure	5,700		
Taxation payable	1,650	12,350	
Working capital			8,400
Total capital employed			136,000
Represented by:			
Owners' capital			
Ordinary shares of $10 fully paid			75,000
Reserves - additional depreciation for replacement of fixed assets		6,500	
General reserve - undistributed profits		11,250	17,750
			92,750
Owners' interest			
Long-term loans - repayable 1992/97 secured			43,250
			136,000

Case study 2: Simportoe budgetary control system

1. The Director General of Simportoe was discussing with his co-directors the budgetary system then in operation at the port. It was October of the first year in which the new board of directors operated the port and there was dissatisfaction with present procedures, which were felt to be inadequate in many respects. The financial director proposed that the chief accountant should outline the present system and explain in particular why the financial results of the port's activities for year 1 differed from the prepared budget of the previous autumn.

2. The chief accountant explained the way in which the budget was prepared. In October of each year the managers of the berths, together with managers from the engineering and commercial departments, dock office and head office, all prepared estimates of the likely level of expenditure in the following calendar year for the department under their control. At present, calculations were on the basis of the expenditure of the previous nine months plus the estimated expenditure of the 3 months of the current year to come. This total figure was then adjusted in the light of known factors, such as changes in staff, rates of salaries and wages, alternatives in costs and maintenance programmes. The engineer's budget included planned expenditure on major works. The departmental budgets were invariably found to be too high and had to be adjusted to a level acceptable to the board. The figures were usually finalized each November preceding the calendar year under review. On the basis of such budgets the consolidated rates charged to customers were reviewed and the commercial department was asked to try to obtain more traffic for the port. The accountant reminded the board that the budget for the current year was already prepared and published before the present directors took office.

3. During this particular current year the income and expenditure to date, together with the budget estimates, had been presented to the board quarterly (see table 8). The figures for the three quarters to 30 September showed an adverse variance from the budget of $270,000. The chief accountant explained that on the present trend a deficit of about $48,000 could be expected for the year to 31 December and should be compared with the budgeted profit of $300,000 which had been estimated during the previous autumn. He then commented on the figures to indicate where the variances from the budget arose. The director general asked what corrective action was being taken to direct finances back to the budgeted level and was told that instructions calling for economies had been given to managers but that these were unlikely at this stage to have much effect on the overall results

Table 8

SIMPORTOE

OPERATING STATEMENT

$'000

	THIRD QUARTER			CUMULATIVE			FORECAST		
	ACTUAL	BUDGET	VARIANCE	ACTUAL	BUDGET	VARIANCE	ESTIMATE	BUDGET	VARIANCE
REVENUE									
GENERAL CARGO	2,436	2,259	177	6,060	5,643	417	8,910	8,316	594
MINERALS	816	840	(24)	1,755	1,770	(15)	2,400	2,340	60
CEREAL	303	321	(18)	810	900	(90)	1,080	1,200	(120)
OIL	756	1,080	(324)	2,310	2,700	(390)	3,000	3,900	(900)
OTHER TRAFFIC	21	30	(9)	54	87	(33)	60	114	(54)
	4,332	4,530	(198)	10,989	11,100	(111)	15,450	15,870	(420)
OPERATING COSTS									
BERTHS	2,673	2,715	42	6,627	6,720	93	9,132	9,423	291
ENGINEERING DEPTS.	240	150	(90)	720	600	(120)	888	810	(78)
DOCK OFFICE	231	255	24	786	795	9	1,080	1,059	(21)
COMMERCIAL DEPT.	135	90	(45)	291	240	(51)	360	348	(12)
TOTAL OPERATING COSTS BEFORE:	3,279	3,210	(69)	8,424	8,355	(69)	11,460	11,640	180
HEAD OFFICE	570	450	(120)	1,080	990	(90)	1,458	1,350	(108)
DEPRECIATION	225	225	-	675	675	-	900	900	-
INTEREST	420	420	-	1,260	1,260	-	1,680	1,680	-
	4,494	4,305	(189)	11,439	11,280	(159)	15,498	15,570	72
PROFIT/LOSS BEFORE TRANSFER TO RESERVES	(162)	225	(387)	(450)	(180)	(270)	(48)	300	(348)

for the year. When questioned on this he made the following points:

(1) The commercial department was loath to commit itself to a reasonably firm forecast of trade handled by the port for any year. This meant that forecasting port operating costs was very difficult.

(2) The operating managers knew this and therefore did not take their budget forecasts too seriously. When presenting budgets they tended to overstate expenditure on the assumption that this would be cut back.

(3) Much of the financial information given by the accounts department to help with budget preparation was suspect in the eyes of the departmental managers. In particular, they objected to the costs in their budget over which they had no control, e.g. head office and dock office administration costs, of which some were charged out to various departments.

(4) Finalization of the complete budget was always a difficult procedure. Expenditure invariably exceeded revenue and cuts were made indiscriminately across the board for all departments. This made nonsense of the whole forecasting procedure. In particular, the engineering department felt that their budget allowance was never adequate for all the work of maintaining and improving the facilities of the port.

(5) Because of points 2, 3 and 4, managers shrugged off differences which arose from overspending on the grounds that their original estimates had been cut without their approval. Any underspending was taken as a reflection of good management.

(6) Comparisons between actual and budget figures were made quarterly - usually some 4 - 5 weeks after each quarter had ended. Although by then it was too late for immediate useful corrective action, these comparisons were helpful for future budgeting. Heavy overspending could be remedied by drastic cutting back in future expenditure on such things as maintenance and staff training, recruitment, travelling, entertainment, etc.

(7) Departmental statements comparing actual with estimated expenditure were not integrated with the financial accounting system.

(8) Departmental budgets were compiled from an examination of past costs and expenses amended to reflect estimated rises or falls in expenditure. But these past costs could hide past inefficiencies due to poor control and bad working procedures.

4. The chief accountant ended by pointing out that the present budgeting system was inadequate and time-consuming and was criticised by most senior staff members. He indicated, too, that his own department was short-staffed and over-worked and said that he had pressed the board to appoint a management accountant. Until this was done the system could not be improved. He reminded the Board that the budget was about to be compiled for the next calendar year and asked whether he should proceed with the existing system or whether changes should be made.

5. When the chief accountant had given his report, the board, after much discussion, decided:

(1) To continue with the present budgeting system for the next calendar year (Year 2).

(2) To appoint a management accountant to investigate, in detail, the present system.

(3) To implement these recommendations, if acceptable, in Year 3.

6. By 1 January of Year 2 a management accountant and his staff were appointed and by the middle of the year had submitted their report and recommendations. In brief, these were as follows:

(1) To establish control areas throughout the port.

(2) To separate out the operational from the service areas.

(3) To relate income (where applicable) and expenditure to each control area.

(4) To identify responsibility for income and expenditure to particular management positions.

(5) To incorporate in managers' reports, where appropriate, performance statistics so that costs could be related to activity and other physical factors. In this respect a work study unit would be set up to calculate standard costs for all regular activities in the operational areas.

(6) To introduce procedures that would assist in the preparation of financial statements to assist management in its planning, control and decision-making functions.

7. Specific proposals to implement the recommendations were that:

(1) Nine main control areas be set up as follows:

Engineering Department
Commercial Department
Head Office
Dock Office
General Cargo Berths
Mineral Berths
Grain Terminal
Oil Berths
Roll-on/Roll-off Berth

(2) Within these areas, where appropriate, separate sub-areas of control be established for distinct and separate functions.

(3) Managers of areas would be responsible only for the costs that they could influence and control, plus certain other costs allocated to them on an agreed and acceptable basis. For example, the costs of service functions and those of the dock office would be allocated (for budget and other expenditure) to the operating departments and other units that benefited from the services. The cost statements of such service functions would show the comparison of budgeted costs with actual costs, and how the expenditure had been allocated to operating and other areas. Such allocations would reflect the work performed for the relevant departments. Costs not recovered would be included in dock office and head office overheads as appropriate.

(4) The budgetary control system would separate out income and expenditure for each area of responsibility and control.

(5) Performance and activity statistics would be provided on a weekly basis and incorporated in the reports for each operating area. All control areas would receive a monthly report showing actual and budget figures to date on a monthly and cumulative basis. Managers responsible for the control areas would receive these reports within 5 working days of the end of the month.

(6) A budget committee would be set up with representatives from all the main control areas together with the director general, the chief accountant and the management accountant. This committee would meet at regular intervals to formulate plans (drawn up in financial terms) which had been designed to implement the aims and objectives agreed by the board of directors for the next calendar year. Actual performance against budget figures would be monitored by the management accountant and his staff, who would report back to the budget committee.

The following timetable was recommended

(1) In August of each year the commercial department would submit forecasts of anticipated tonnages and gross revenues expected during the calendar year. This forecast would detail tonnages and revenues for each class of cargo, whether for loading or discharging, and the times that these were expected to arrive at the port.

(2) From this forecast all other departments would submit estimates of their costs and expenses, given the level of activity indicated by the commercial department. All managers of sub-areas of responsibility and control, whether operational or service, would participate in

estimating their needs in terms of men, equipment and services required to handle the anticipated level of work.

Note: Accounting records, statistics and the newly calculated standard costs for activities would be used in arriving at the above estimates. A separate estimate (and ultimately separate budget) would be prepared for the acquisition of capital equipment. The accounting department would assess the financial viability of such projects and a report would accompany each proposal submitted to the board.

(3) Income costs and expenses of operating departments would be related to the cargoes handled to see whether the rates charged to customers were sufficient to produce an acceptable gross margin or contribution to overheads. Where service departments charged other control areas for services these would be at a mutually agreed rate.

(4) At the end of September the budget committee would examine the financial forecasts to see whether they indicated an acceptable surplus. Any estimate amendments would need discussions and approval by the managers concerned and the budget committee.

(5) On the basis of the agreed forecasts and estimates for control areas, budgets would be compiled showing relevant income and expenditure on a monthly basis for the calendar year. These would be published and distributed to those concerned.

(6) Entries in the accounting system would be analysed over the relevant cost and sub/cost centres so that prompt comparison could be carried out each week and within two working days of the end of the week in question.

8. Tables 9, 10 and 11 are examples of the forms to be used in the budgetary control reporting system.

9. During September of Year 2 the manager of the mineral berths spent a good deal of time discussing with the budgeting officer and his own staff the cheapest and most effective way of increasing the throughput of minerals and other traffic in Year 3.

10. Preliminary estimates showed that if the present costs of the mineral berths were maintained and the handling charges for cargoes were not increased, the contribution towards overheads would be too small and therefore unacceptable. Competition for trade with other ports made increased

Table 9

PROFIT AND LOSS STATEMENT PERIOD_____

SIMPORTOE

MAIN CONTROL AREA	THIS PERIOD						CUMULATIVE					
	INCOME		EXPENDITURE		CONTRIBUTION		INCOME		EXPENDITURE		CONTRIBUTION	
	ACTUAL	V.O.B.	ACTUAL	V.O.B.	ACTUAL	V.O.B.	ACTUAL	V.O.B.	ACTUAL	V.O.B.	ACTUAL	V.O.B.
GENERAL CARGO												
MINERAL BERTHS												
GRAIN TERMINAL												
RO RO BERTH												
OIL TERMINAL												
TOTAL OPERATING FACILITIES												
OVERHEADS NOT CHARGED OUT TO DEPARTMENTS												
HEAD OFFICE												
DOCK OFFICE												
INTEREST												
SPECIAL PROVISIONS												
PROFIT/LOSS												

V.O.B. = VARIANCE ON BUDGET

Table 10

SIMPORTOE

MAIN/SUB CONTROL AREA

OPERATING STATEMENT

INCOME AND EXPENSE

PERIOD/CUMULATIVE

CARGO	ACTUAL TONNAGE	BUDGET TONNAGE	V.O.B.	% V.O.B.
MINERALS				
FERTILIZER				
CEMENT ETC.				

	ACTUAL	BUDGET	V.O.B.	% V.O.B.
INCOME				
EXPENDITURE				
LABOUR				
POWER				
ENGINEERING & MAINTENANCE				
DEPRECIATION				
DOCK OVERHEADS ETC.				
TOTAL EXPENSES				
CONTRIBUTION				

Table 11

SECTOR

EXPENSE STATEMENT

PERIOD .....

CONTROL AREA .....

DOCK OVERHEADS

ACCOUNTS CODE SECTION NO	ITEM	THIS PERIOD			CUMULATIVE		
		ACTUAL	BUDGET	VOB	ACTUAL	BUDGET	VOB
	INDIRECT WAGES & SALARIES						
	CANTEEN						
	MATERIALS						
	PROTECTIVE CLOTHING						
	LIGHTING & HEATING						
	WATER						
	PLANT HIRE						
	RATES						
	INSURANCE						
	TELEPHONE						
	ALLOCATED DOCK OFFICE EXPENSES						
	TRANSPORT						
	DEPRECIATION						

handling charges unpopular with the commercial department. On the other hand, the manager believed that there was scope for greater utilization of the existing berths if the unions could be persuaded to co-operate with management and agree to discontinue certain restrictive practices which caused much congestion on the mineral berths. In the light of these early discussions the manager asked for a breakdown of costs and expenses for the berths and called for a meeting with the union officers.

11. After considerable discussion with the union it was agreed that:-

(1) Restrictive practices by berth workers would be discontinued.

(2) The number of gangs working minerals and other cargoes would be reduced from 20 to 16. The displaced men would be found acceptable employment elsewhere in the port.

(3) A new productivity enhancement payment would be made to the men of 10% on all basic and overtime earnings.

(4) In return, the men would co-operate fully with management in the task of discharging cargoes so as to speed up the handling of all mineral and certain other commodities through the berths.

12. Taking these changes into account the manager asked once more for a financial statement from the accounts department. When summarized these indicated a much more satisfactory contribution to overheads.

13. So in the early part of October, the mineral berths' manager worked with his assistants on the budget for Year 3. He was particularly careful about the figures for the first few months, believing that the financial forecasts for this period were more accurate than for the later months in the year.

14. Below is the information that was used to prepare the budget for the month of January.

Traffic forecasts	January
Minerals	
Metric tonnes	26,000
Rate per tonne $6.00	
Fertiliser (Bagged)	
Metric tonnes	20,000
Rate per tonne $2.25	

Cost information

Direct labour	Annual cost Basic
Ship, quay and shed foreman 16 at $4,740 p.a.	$75,840
Other workers 262 at $3,600 p.a.	$943,200

Plus productivity enhancement payment of 10%.

Power $.06 per metric tonne handled.

Engineering and maintenance of mineral berth for the year $129,000 accruing evenly.

Depreciation of plant and equipment $22,500 p.a.

Berth overheads for January

	January
Indirect labour	27,500
Canteen	1,350
Materials	105
Protective clothing	300
Lighting and heating	2,100
Water	100
Plant hire	-
Local services	1,800
Insurances	2,250
Telephone	150
Transport	300
Allocated head office expenses	10,200
Depreciation	300
	$ 46,455

15. At the beginning of February the manager of the mineral berths eagerly awaited the first reports to be issued under the new budgetary control system.

16. On the morning of the 8th he received reports for January and observed that, instead of the budgeted surplus of $45,740 the reports showed a surplus of $23,829 (see tables 12 and 13). In the light of these results the manager called for a report from the officer responsible.

Table 12

SHIPORTOE

MAIN/SUB CONTROL AREA

OPERATING STATEMENT

INCOME AND EXPENSE

Mineral berths

January

CARGO	ACTUAL TONNAGE	BUDGET TONNAGE	V.O.B.	% V.O.B.
MINERALS	22,500	26,000	(3,500)	13.5%
FERTILISER	20,400	20,000	400	2%
CEMENT ETC.				

	ACTUAL	BUDGET	V.O.B.	% V.O.B.
INCOME	180,900	201,000	(20,100)	10%
EXPENDITURE				
LABOUR	95,922	93,420	(2,502)	2.6%
POWER	2,574	2,760	186	6.7%
ENGINEERING & MAINTENANCE	10,800	10,750	(50)	-
DEPRECIATION	1,875	1,875	-	-
DOCK OVERHEADS ETC.	45,900	46,455	555	1.2%
TOTAL EXPENSES	157,071	155,260	(1,811)	1.2%
CONTRIBUTION	23,829	45,740	(21,911)	43%

Table 13

SUPPORTON

EXPENSE STATEMENT PERIOD JANUARY

CONTROL AREA Mineral berths..... DOCK OVERHEADS

ACCOUNTS CODE SECTION NO	ITEM	THIS PERIOD			CUMULATIVE		
		ACTUAL	BUDGET	VOB	ACTUAL	BUDGET	VOB
	INDIRECT WAGES & SALARIES	27,419	27,500	81			
	CANTEEN	1,311	1,350	39			
	MATERIALS	48	105	57			
	PROTECTIVE CLOTHING	249	300	51			
	LIGHTING & HEATING	2,166	2,100	(66)			
	WATER	100	100	-			
	PLANT HIRE	225	-	(225)			
	RATES	1,800	1,800	-			
	INSURANCE	2,250	2,250	-			
	TELEPHONE	150	150	-			
	ALLOCATED DOCK OFFICE EXPENSES	9,540	10,200	660			
	TRANSPORT	342	300	(42)			
	DEPRECIATION	300	300	-			
		45,900	46,455	555			

Variance No.1

17. This arose from the late arrival of a vessel which berthed on 3 February and was currently discharging cargo at the mineral berth.

Variance No. 2

18. The labour variance arose from damage to a fork-lift truck battery charging unit. One of the electrically propelled fork-lift trucks struck the battery charging unit which was situated at the end of one of the mineral berths, putting it out of commission. Work on a vessel was slowed down and extra hours worked to get the vessel away on time, hence overtime of $2,500. A replacement battery charging unit was hired - see plant hire adverse variance of $225.

19. The purpose of budgetary control is to highlight such variances in order to prevent repetition of unnecessary expenditure. To do this the reason for the accident must be discovered.

(1) Was the charging unit badly situated?
(2) Was visibility poor on the berth?
(3) Was the truck properly maintained, i.e. did the brakes function properly?
(4) Was the driver properly trained to drive trucks?
(5) Was the driver ill or drunk?

20. The variances arising from this event could be the fault of the:-

(1) Civil engineers - bad siting of charging unit.
(2) Mechanical engineers - poor machine maintenance.
(3) Berth foreman - allowing an incompetent driver to operate truck.
(4) Personnel and training department - poor training of driver.

21. Finding out who was responsible for the accident is the necessary step to see that it does not happen again. Recurring damage and expense of this kind could soon erode the profits of the port.

Variance No. 3

22. Berth office gain variance of $660 arose from a miscoding of expenditure incurred by the administration department. The error would be rectified in February.

23. This last point is to emphasize the fact that a gain variance is not necessarily a reduction in costs. It can arise from misposting of expenditure.

Note: Table 9 gives, in a summarized concise manner, all the information required by the directors. Attached to this form would be the back-up information - Tables 10 and 11 for each of the control and sub-control areas, with notes explaining the reason for material variances from the budget. Table 14 shows the summary of January presented to directors.

Table 14

PROFIT AND LOSS STATEMENT

PERIOD January

SIMPORTOE

MAIN CONTROL AREA	THIS PERIOD						CUMULATIVE					
	INCOME		EXPENDITURE		CONTRIBUTION		INCOME		EXPENDITURE		CONTRIBUTION	
	ACTUAL	V.O.B.	ACTUAL	V.O.B.	ACTUAL	V.O.B.	ACTUAL	V.O.B.	ACTUAL	V.O.B.	ACTUAL	V.O.B.
GENERAL CARGO	818,441	6,559	543,883	6,117	274,558	12,676						
MINERAL BERTH	180,900	20,100	157,071	1,811	23,829	21,911						
GRAIN TERMINAL	148,500	1,500	110,000	500	38,500	2,000						
RO RO BERTH	185,625	5,625	68,200	1,200	117,425	4,425						
OIL TERMINAL	450,000	10,000	18,000	200	432,000	9,800						
TOTAL OPERATING FACILITIES	1,783,466	12,534	897,154	9,828	886,312	22,362						
OVERHEADS NOT CHARGED OUT TO DEPARTMENTS					472,750	12,750						
HEAD OFFICE			229,000	6,500								
DOCK OFFICE			103,750	6,250								
INTEREST			140,000	-								
SPECIAL PROVISIONS												
	1,783,466	12,534	1,369,904	22,578	413,562	35,112						
PROFIT/LOSS												

V.O.B. = VARIANCE ON BUDGET

ANNEX I

FINANCIAL OBJECTIVES FOR THE PORT INDUSTRY

Extract from Financial Objectives for the Port Industry
by the National Ports Council, London, June 1975

Conclusion and recommendations of the report

"28. Charging policy and investment criteria will, over time, largely determine the financial rate of return earned on port assets. Clear financial objectives are necessary to help toward ensuring that there are adequate liquid resources available at all times to meet all cash liabilities as they fall due, and will also aid management in setting realistic incentives to efficiency and maintain morale within the industry. Whether one adopts a cash flow or a return on capital objective there are both advantages and problems. In the last resort, however, it is the sufficiency of cash flow to meet maturing liabilities and an element of capital replacement/expansion which is essential for the survival of any business; it is also an objective which all concerned with the port industry can recognise as necessary. Either objective must relate to the overall performance of a port undertaking in its full range of activities, i.e. including, for example, cargo handling, and not restricting it to the ship or goods dues element.

29. We have reached the conclusion that the prime objective should be expressed in cash flow terms but that this should be applied in conjunction with a fallback criterion based on return on capital; we therefore recommend that the minimum financial objective for each port undertaking be described as follows:

'A sufficiency of internally generated cash flow in each financial year to meet:

(i) Interest and any taxation and dividends to shareholders;

(ii) The redemption of capital debt actually falling due for repayment in the financial year and provision towards the redemption of capital debt fall due for repayment in future years, subject to the following:-

(a) where temporary borrowings are used to finance net current assets, the same proportion of such borrowings to total net current assets can be assumed to continue;

(b) where long-term assets have been financed by short-term borrowings, re-borrowing (at current interest rates) for not more than the expected economic life of such assets can be assumed;

(c) where loans are repayable on an annuity basis the interest will already have been included in (i) above and it follows that only the element in the annual repayment which relates to principal should be included under (ii);

(d) where capital debt is due for repayment in future years on a maturity basis it would be appropriate to include a calculated moving annual average of the maturities over the relevant future years (i.e. an aggregation of the amount outstanding on each loan divided by its remaining life), or where it is the normal practice of the port undertaking concerned to provide for the redemption of capital debt by annual sinking fund provisions[1/] these latter could be included as the basis for the objective;

(e) where capital debt redeemed in the financial year under consideration is repaid wholly or partly from cash, deposits and/or temporary investments held at the commencement of that financial year, the amount of the liquid resources so used can be offset against the amount of loan redemptions in the annual cash flow objective calculation, provided that the liquid resources so used have been derived from internal cash generation in previous years and provided also that such resources are not required to meet current liabilities or capital debt maturities falling due in future years;

(iii) 50% of all capital expenditure (excluding any interest capitalised) subject to the understanding either that where capital expenditure falls unevenly in a given financial year, the proportion may be applied to the average of the current year's expenditure and that of the preceding three years or that where a major new project (defined as estimated to cost more than (say) 20% of total capital employed) is being constructed, capital expenditure on such a project may be averaged over such future period of years as may be determined by the port undertaking concerned at the project's inception. The general aim should be to make this period as short as reasonably possible and it

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1/ The term sinking fund means a cash sum set aside at regular intervals and invested so that it is available to meet a known liability repayable on a specified date.

should rarely, if ever, be allowed to exceed 10 years, though there may be special circumstances such as the construction of a major new dock system which may justify a longer period;

with the proviso that the annual consolidated surplus before exceptional items, taxation, and interest charged to revenue, but after making full and proper provision for depreciation out of revenue, represents a return on capital of not less than 10% (apart from exceptional cases where a port undertaking has a major new project under construction (defined in this case as estimated to cost more than 50% of total capital employed) when a target return of less than 10% may be acceptable in the period until the new project becomes operational). For this purpose "capital employed" is defined as "the net book amount at year-end of fixed assets and net current assets but without deducting bank or other short-term borrowings and also without deducting provisions for deferred liabilities, e.g. deferred taxation, staff pensions".' "

ANNEX II

DEPRECIATION METHODS IN ACCOUNTING

1. First we define the elements involved in depreciation:

   (a) Useful life: this is the estimation made regarding the period that the asset will be productive in the port. It is also called the service life or working life.

   (b) Residual value: this is the estimation of the price that the asset will have at the end of its useful life if it is sold. It is also called salvage value.

   (c) Rate technique: this is the procedure used to calculate the annual charge (complement to the base).

   (d) Base: this is the figure used in combination with the rate technique to calculate the annual charge.

2. In selecting the method of depreciation, the following aspects have to be considered:

   (a) Accounting concept: depreciation is a process of cost allocation.

   (b) Requirements of the accounting principles; it must be systematic and rational.

   (c) Legal requirements that conform to the accounting practices of the port (including tax situation, if relevant).

   (d) Reality and practicability: it must try to allocate real costs in a practical way.

3. The techniques used for recording the depreciation are:

   (a) In addition to the account reflecting the asset and the account reflecting the cost charge to the financial results, another account is set up (called accumulated depreciation or allowance for depreciation) whose balance is shown following deduction from the figure of the asset mentioned in the balance sheet.

   (b) There are only two accounts, one showing the cost charge and the other showing on the debit side the asset, and the depreciation on the credit side. However, the presentation of figures in the balance sheet does not differ from the previous technique.

4. Taking into consideration the elements of depreciation, we generally have the following methods:

5. Related to the base: (a) historical cost method
(b) replacement cost method
(c) current cost method

6. Related to the rate technique: (a) straight line method
(b) accelerated method
(c) interest method

7. Theoretically, any one of the three first methods could combine with any one of the second three. However, in practice this is not the case. The most commonly used methods are:-

Straight line method

8. The name of the method derives from the fact that if the book value of the asset is plotted in a graph the result will be a straight line whose slope will be equal to the annual depreciation charge, which will remain the same during the useful life.

9. The formula is: $\text{Depreciation charge} = \frac{\text{Cost - residual value}}{\text{Useful life}}$

10. This method is generally used with historical cost, and very commonly applied due to its simplicity. But as anybody can see, the cost allocation produced is not very accurate.

Example: a fork-lift truck has been bought for $24,000, the estimated useful life is 6 years and the residual value nil. Applying this method, the depreciation would be as shown in table 15.

Table 15

Depreciation on a straight line basis

$

Year	Annual depreciation charge	At the end of the year	
		Book value	Accumulated depreciation
1	4,000	20,000	4,000
2	4,000	16,000	8,000
3	4,000	12,000	12,000
4	4,000	8,000	16,000
5	4,000	4,000	20,000
6	4,000	nil	24,000

Accelerated method

11. With this method the depreciation charge is bigger during the early years and diminishes with time. The advantage of this method is that the higher charges during the first periods reflect more accurately the depreciating value of the asset. Also, it is argued that as maintenance and repair costs are lower in the beginning and higher at the end, this method evens out the total costs of the assets. The real advantage of it lies in the tax field. Applying this method, where laws accept it, smaller amounts of taxes are paid at the beginning of the life of the assets, allowing a better financing of new ventures.

12. This method can be used in several ways; i.e. "Sum of the years' digits" (see table 16), "declining balance" or "double declining balance".[1/] An example of the first follows:

The formula is:

$$D_t = \frac{n + 1 - t}{\sum_{1}^{n} j} \quad (c - s)$$

where

D_t = depreciation charge in period t

c = cost of the asset (generally historic cost)

s = residual value

n = useful life

13. A quay crane is bought for $200,000 and its useful life has been estimated as 15 years with a residual value of nil. Annual depreciation charges would be:

1/ Davidson, Sidney, Handbook of Modern Accounting (New York), McGraw-Hill 1970.

Table 16

Depreciation on "sum of the years' digits" method

Year	Annual depreciation charge *	Book value	Accumulated depreciation
1	25,000	175,000	25,000
2	23,300	151,700	48,300
3	21,600	130,100	69,900
4	20,000	110,100	89,900
5	18,300	91,800	108,200
6	16,600	75,200	124,800
7	15,000	60,200	139,800
8	13,300	46,900	153,100
9	11,600	35,300	164,700
10	10,000	25,300	174,700
11	8,300	17,000	183,000
12	6,600	10,400	189,600
13	5,000	5,400	194,600
14	3,300	2,100	197,900
15	2,100	nil	200,000

* rounded figures

Interest method

14. In this method the interest concepts and formulae are used (simple and compound), giving different approaches. Their application intends to take into account the charging value of money and to introduce into depreciation the economic concept of opportunity cost. A description of the method and formula used is found in the report by the UNCTAD secretariat, Port pricing.[1/]

Replacement cost method

15. In the methods previously mentioned the historical cost or original value of the asset is usually used. The inherent drawback of this has given rise to the use of the replacement cost concept, i.e. the depreciation charges must be made on the basis of "what it will cost to replace the asset". This cost, naturally, will be an estimate and will require adjustments from time to

1/ TD/B/C.4/110/Rev.1. United Nations publication, Sales No. E.75.II.D.7.

time. This method tries to have more realistic and useful depreciation charges for purposes of pricing and capital maintenance. Generally it is used with a straight line rate technique.

Current cost method

16. In this method the depreciation charge is computed as a proportion of the current cost of the asset. This last figure is produced using price indices and adjusting the values of the asset and depreciation charges annually. Due to the fact that sometimes it is difficult to find the proper index for every given type of asset, although it is theoretically correct, it has not been commonly applied.

ANNEX III

GLOSSARY OF ACCOUNTING TERMS

Account:	1. A formal record of an asset, liability, proprietorship revenue or expense in which the effects of operations are indicated in terms of money. 2. Book-keeping record in general. 3. To keep accounts.
Account payable:	An amount owing to a creditor; generally limited to a liability for purchases of goods or services.
Accounting period:	Period of time used to measure the financial operation of an entity (usually one year). Time elapsed between the publication of financial statements.
Account receivable:	An amount claimed against a debtor, usually arising from the sale of goods or services.
Accrual:	A developing but not yet enforceable claim by another person, which is accumulating with the passage of time or the receipt of service. It arises from the purchase of services which at the date of accounting have been only partly performed, are not yet billable and have not been paid for.
Accumulated depreciation:	The total to date of the periodic depreciation charges on fixed assets since they were placed in use.
Accumulated profit:	Synonym of surplus - see retained earnings.
Amortization:	1. The gradual and systematic writing off of a balance in an account over an appropriate period. 2. The gradual extinction or provision for extinction of a debt by serial redemption or sinking fund payments.
Appropriation account:	An account to which net profits are carried and from which transfers are made to reflect the disposition of such profits.
Asset:	Something owned by the business which has a measurable cost.

Associated companies:	When a company holds shares in another company, not being a subsidiary, and these holdings exceed a certain size (roughly one-tenth of the nominal value or one-tenth in value of its own assets) the holding is described as an associated company.
Authorized capital:	The number and par value, if any, of shares of each class of capital stock that a company may issue in accordance with its statutory regulations.
Bad debt:	An account or note receivable that is considered uncollectable.
Balance:	The difference between the debits and credits in an account.
Balance sheet:	Financial reports that show in the form of a concise statement, assets, liabilities and owner's equity of an entity as at a particular moment of time. It is not a statement of economic worth.
Bond:	A long-term loan, supported by certificates of indebtedness issued by a collective body. The term usually implies the assets have been pledged as security.
Book value:	1. The amount at which an item appears in the books of account and financial statements. 2. The amount of the net assets of the business shown in a balance sheet. The term is not an appropriate description of a basis of valuation of the assets.
Capital asset:	An asset, whether tangible or intangible, intended for long-term use and held as such.
Capital reserve:	Part of the owners' equity not available for normal dividends. It does not represent cash.
Cash structure:	The classification by nature of the claims of lenders usually restricted to long-term debt and owners against the business. It is distinguished from financial structure, which includes short-term debt.
Cash flow:	The figure resulting from adding back to income items that do not affect working capital, such as depreciation and amortization. This is used to give an approximation of the funds produced internally for self-financing.

Closing stock (inventory):	Inventory at the end of the accounting period. Part of the computation of cost of goods consumed in operations.
Consolidated statements:	The financial statements of a parent company and one or more subsidiaries combined so as to ignore the separate legal identities of the companies and show the financial position and operational results of the group as a single enterprise.
Contingent liability:	A legal obligation that may arise in the future out of past and/or present circumstances provided certain developments occur. Generally, it is not recorded in the books, but mention should be made in a note of the balance sheet.
Cost accounting:	That branch of accounting concerned with the classification, recording, analysis, reporting and interpretation of expenditures identifiable with production and distribution of goods and services.
Creditor:	One to whom a debt is owed.
Current asset:	Unrestricted cash or other asset that is normally converted in cash or consumed in the production of income during the operating period.
Current liability:	Liability due for payment within one operating period.
Debenture:	A long-term debt instrument that is not secured by a mortgage on specific assets.
Debtor:	One who owes a sum of money to the business.
Depreciation:	Allocation of the cost of a fixed asset to the expenses over its estimated useful life.
Earnings:	Generic term used to mean income or profit.
Fixed asset:	A tangible long-term asset such as land, plant and equipment, etc. held for use rather than for sale.
Goodwill:	Intangible asset of a firm established by the excess of the price paid for the business over its book value.
Holding company:	A company that holds more than one half of the owners' equity of another company. (The company whose capital is held is called subsidiary company).

Income statement:	A financial statement summarizing the items of revenue income, expenses and loss for a stated period. Also called revenue statement, profit and loss statement.
Intangible asset:	A long-term or non-current asset that lacks physical substance, e.g. goodwill, patents.
Inventory:	Stock of goods on hand (including stores and supplies).
Issued capital:	Portion of authorized capital stock for which shares have been issued.
Ledger:	A book of secondary entries containing all the accounts including control accounts or all the accounts of a particular type.
Liquidity:	The convertibility of assets into ready cash.
Long-term liability:	Liability not due for payment within one year.
Loss:	The excess of expenses over revenues for a period. A cost incurred without return or benefit.
Mortgage:	Long-term loan secured on a specific fixed asset.
Net profit:	Profit for the accounting period after income tax; also called net earnings or net income.
Non-operating income:	Income not arising from normal operations of the business.
Opening stock:	Expenses which are incurred to produce a commodity or render a service, but which cannot conveniently be attributed to individual units of production, service activity or operation.
Owners' equity:	The interest of the owners or proprietors in the assets of a business. It is represented by the excess of the total assets over the total liabilities to outside interests. Also called capital or shareholders' equity.
Retained earnings:	The accumulated balance of income less losses of a corporation, after taking into account dividends and other appropriate charges or credits.
Receivable:	See account receivable.
Tangible asset:	An asset that has physical substance.
Trial balance:	Schedule of debit and credit balances extracted from all the accounts in the ledgers that is used for preparing the balance sheet.
Working capital:	The excess of current assets over current liabilities.

ANNEX IV

Bibliography for further reading

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